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Part 2

INTEGRATED INFORMATION SUPPORT SYSTEM (IISS)
Volume VII - Communications Subsystem
Part 2 - Generic Communications Protocol Product Specification

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FOREWORD

This technical report covers work performed under Air Force Contract F33600-87-C-0464, DAPro Project. This contract is sponsored by the Manufacturing Technology Directorate, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. It was administered under the technical direction of Mr. Bruce A. Rasmussen, Branch Chief, Integration Technology Division, Manufacturing Technology Directorate, through Mr. David L. Judson, Project Manager. The Prime Contractor was Integration Technology Services, Software Programs Division, of the Control Data Corporation, Dayton, Ohio, under the direction of Mr. W. A. Osborne. The DAPro Project Manager for Control Data Corporation was Mr. Jimmy P. Maxwell.

The DAPro project was created to continue the development, test, and demonstration of the Integrated Information Support System (IISS). The IISS technology work comprises enhancements to IISS software and the establishment and operation of IISS test bed hardware and communications for developers and users.

The following list names the Control Data Corporation subcontractors and their contributing activities:

SUBCONTRACTOR	ROLE
Control Data Corporation	Responsible for the overall Common Data Model design development and implementation, IISS integration and test, and technology transfer of IISS.
D. Appleton Company	Responsible for providing software information services for the Common Data Model and IDEF1X integration methodology.
ONTEK	Responsible for defining and testing a representative integrated system base in Artificial Intelligence techniques to establish fitness for use.
Simpact Corporation	Responsible for Communication development.

Structural Dynamics Research Corporation	Responsible for User Interfaces, Virtual Terminal Interface, and Network Transaction Manager design, development, implementation, and support.
Arizona State University	Responsible for test bed operations and support.

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SECTION 1

SCOPE

1.1 Identification

This specification establishes the 'as built' design of the Communications Subsystem.

1.2 Functional Summary

The Communications Subsystem provides the mechanism for transporting messages between:

(1) Two computers running the Integrated Information Support System
(2) Two processes running under the Integrated Information Support System

The portion that performs the first function is referred to as COMM; the second function is performed by a set of routines that is referred to as the Interprocess Communication Primitives or IPC's.

COMM uses asynchronous lines to support the transmission of messages between two computers. The communications protocol used across the lines is contention until a session is started at which time it switches to half duplex, interleaved, bidirectional message transmissions. COMM will deliver messages to its peer on the remote computer in the order in which they are received from the Network Transaction Manager. Messages may be variable in length. If the message is larger that a transmission block, COMM will segment the message and reassemble it at the receiving end. If the message is smaller than a transmission block, COMM will transmit only the message plus seven (7) characters. A longitudinal redundancy check is applied to each message to maintain message integrity. Messages are given a sequence number to ensure no messages are lost. Transmission failures or receiving a non-acknowledgment will result in the retransmission of the message. If either or both of these conditions occur consecutively for a specified number of times, the link between the two computers is assumed to be down and is reported to the Network Transaction Manager as such. Random unsuccessful transmissions or receptions of a message are logged as recoverable errors.

COMM never terminates because of the status of the link to the other computer. It will terminate only if it receives an illegal command from the Network Transaction Manager or if it fails to initialize the asychronous line (terminal port) on start-up.

Messages must be classified as containing either binary data or native data. Binary data is converted to the native data representation of each nibble (4 bits) for transmission, then converted back to binary for delivery of the message at the receiving end. There is no translation of native data except for control characters. Control characters can be used in native data messages in which case they are translated to two characters for transmission. The two characters are a special character to indicate special processing is required on the following character and a character that indicates which control character. The special character is the exclamation mark (!).

Translation between EBCDIC and ASCII, necessary to support communications between the IBM and non-IBM environments, is performed by a hardware protocol converter.

The configuration of the network is point-to-point; therefore, there is a COMM process running on each computer for each remote computer in the Integrated Information Support System.

SECTION 2

DOCUMENTS

2.1 Reference Documents

The following pertinent reference materials are available at the ICAM Program Office.

1. Interim Reports

2. Life Cycle Documents
   (a) ITR620150002U Project Scope
   (b) PMP620150000 Master Plan and Schedule
   (c) SAD620150000 State-of-the-art Review
   (d) SRD620140000 System Requirements Document
   (e) SDS620140000 System Design Specifications
   (f) DS6201430000 Development Specification - Communications Subsystem

The following reference materials are available from Digital Equipment Corporation.

(a) VAX/VMS I/O User's Guide (Volume 1), Order No. AA-M540B-TE
(b) VAX/VMS I/O User's Guide (Volume 2), Order No. AA-M541B-TE
(c) VAX COBOL Language Reference Manual, Order No. AA-H631C-TE
(d) VAX-11 FORTRAN Language Reference Manual, Order No. AA-D034C-TE

Other reference materials are as follows.

(a) International Organization for Standardization, Open Systems Interconnection, Information Processing Systems - Basic Reference Model, TC 97/16 N 719
(b) International Organization for Standardization, Open Systems Interconnection, Draft - Connection-Oriented Transport Service Definition TC 97/16 N 860
(c) International Organization for Standardization, Open Systems Interconnection, Draft -

Connection-Oriented Transport Protocol Specification Version 1.2, TC 97/16 N 861

(d) International Organization for Standardization, Open Systems Interconnection, Draft - Connection-Oriented Session Protocol Definition TC 97/16 N 856

(e) National Bureau of Standards, Specification of the Transport Protocol, Volume 2: Basic Class Protocol, Draft Report, September 1981, Report No. ICST/HLNP-81-12

(f) National Bureau of Standards, Specification of the Transport Protocol, Volume 3: Extended Class Protocol, Draft Report, September 1981, Report No. ICST/HLNP-81-13

(g) National Bureau of Standards, Specification of the Transport Protocol, Volume 4: Network Interfaces, Draft Report, September 1981, Report No. ICST/HLNP-81-14

2.2 Terms And Abbreviations

1. Longitudinal Redundancy Check - The summation of all the bytes in a message. It becomes three bytes that are attached to the end of the message to ensure its integrity.

2. Interhost Communication Primitives (IHC's) - A set of routines used by COMM to interface to the operating system and the terminal driver. They are always system dependent.

3. Interprocess Communication Primitives (IPC's) - A set of routines used to communicate between two processes on the same computer. They are always system dependent.

SECTION 3

REQUIREMENTS

3.1 Structural Descriptions

The overall structure of COMM is similar to that of a device driver. It runs asynchronously in response to interrupts. After COMM is initialized, it waits to receive a message, either from the Network Transaction Manager or from COMM on the remote computer.

The four (4) top level components of COMM process its four possible states.

(1) Session Inactive (ACTSES)
(2) Session Active, Line Idle (IDLINE)
(3) Session Active, Line Bid (LBRESP)
(4) Session Active, Line Active (ALINPS)

See the hierarchy charts in Section 3.10.10 for the complete structure of COMM.

3.2 Functional Flow Description

In each of the four states, COMM performs different activities. In state one (Session Inactive), COMM is waiting for the Network Transaction Manager to send a control message requesting that a connection be made to COMM on the remote computer. While in state one, all messages for COMM from the remote computer are ignored.

Upon receiving the "start link" message from the Network Transaction Manager and the correct response for COMM on the remote computer, COMM moves to the second state (Session Active, Line Idle). In state two, COMM is waiting for:

(1) A message from the Network Transaction Manager that must be sent to its peer process on the remote computer or a control message to shutdown, or
(2) A Line Bid from COMM on the remote computer indicating it has at least one message from its Network Transaction Manager that must be sent.

If a message is received from the Network Transaction

Manager for transmission to it peer process on the remote computer, COMM moves to the third state (Session Acive, Line Bid) and transmits a line bid to COMM on the remote computer. When the acknowledgment for the line bid is received from the remote computer, COMM's state changes to four (Session Active, Line Active).

In state four, messages are received and transmitted in a bidirectional, half duplex, interleaved mode until neither COMM program has a message to send. At this time the master for that session sends an End Of Transmission (EOT) message and both COMM's return to state two (Session Active, LIne Idle).

If, while in state two, COMM receives a Line Bid request from the remote COMM, it transmits an acknowledgment and moves to state four to receive messages from the remote computer and transmit any message it receives from the Network Transaction Manager during this session.

If there is a collision of Line Bid requests, both COMM's apply a backoff algorithm so that one COMM will retransmit the Line Bid ahead of the other.

If the transmission is lost (no response from the remote computer over a period of time during which several retransmissions are made), COMM reverts to state one (Session Inactive) and sends a message to the Network Transaction Manager indicating that the link has failed.

3.3 Interfaces

COMM communicates with only one process, the Network Transaction Manager, from which it receives control directions and messages to be sent to the remote computer. In turn, COMM sends the NTM messages received from the remote computer and the status of the communications line. The interface between COMM and the Network Transaction Manager is performed by the Interprocess Communication Primitives (IPC's).

Communications with the remote computer is accomplished through the terminal drivers for the respective computers. The interface to each terminal driver is through a set of routines referred to as the Interhost Communication Primitives (IHC's). Section 3.2.6 of the Communication Subsystem Development Specification presents detailed descriptions of each IHC, its inputs and its outputs.

3.4 Program Interrupts

As mentioned previously, COMM is interrupt driven with interrupts coming either from the IPC's on behalf of the Network Transaction Manager or from the IHC's on behalf on the operating system terminal driver that has received a message from COMM on the remote computer. Waiting for these interrupts is performed by one of the IPC wait primitives. If a response must be received within a particular time interval, the IPC's associated with timing are used along with one of the wait's.

3.5 Timing And Sequence Description

Timing and sequencing is relevant to COMM only after a Line Bid has been received from COMM on the remote computer. At this time, the half duplex, bidirectional, interleaved message transmission protocol begins between the two COMM's. Messages must be received from the remote COMM, processed to determine if the message should be ack'ed or nack'ed, and sent on to the Network Transaction Manager if complete. Also, messages from the Network Transaction Manager must be received, prepared for transmission and built into a message with the status of the message received from the remote COMM. Finally, the message must be sent to the remote COMM before it decides that its message must have been lost and retransmits it. Although retranmissions are processed correctly by the receiving COMM, for performance reasons it is better that this situation not occur.

All this timing and sequencing activity occurs in state four (Session Active, Line Active) and is under the control of the computer program component Active Line Response (ALRESP). The primary CPC's used to perform the work are

(1) Process Input Message, If Present (PINPMS)
(2) Process Output Message (POUTMS)
(3) Complete and Transmit Message (KPLXMT)

3.6 Special Control Features

The Communications Subsystem does not include any special control features as defined in the ICAM Documentation Standards manual.

3.7 Storage Allocation

3.7.1 Data Base Definition

3.7.1.1 File Description

COMM does not use files.

3.7.1.2 Table Description

COMM has a set of tables used fortransformations needed to successfully transmit messages containing control characters and a set of tables to calculate the longitudinal redundancy check in both the ASCII and EBCDIC environments. Both sets of tables are described in the Communications Subsystem Development Specification manual, Section 3.2.1.4, Interface Between IBM and non-IBM Computers.

3.7.1.3 Item and Constant Description

The format of the message transmitted between the two COMM's is also described in the DS, section 3.2.2, Message Format.

There are also a set of constants referred to as the COMM system parameters. They are

```
*
*  COMM CONFIGURATION PARAMETERS
*
 01  FLAGS.
     03  PRIMARY                              PIC X.
     03  MAX-RETRY                            PIC 99 VALUE 3.
*
* TIME INTERVAL SETTINGS
*
     03  MASTER-TIME                          PIC 9(6) VALUE 15.
     03  SLAVE-TIME                           PIC 9(6) VALUE 135.
     03  PRIMARY-CONTENTION-TIME              PIC 9(6) VALUE 5.
     03  SESSION-NOT-ACTIVE-RESP-TIME         PIC 9(6) VALUE 300.
*
* SYMBOLS INDICATING IISS COMPUTERS
*
     03  HOST-COMPUTER                        PIC X.
     03  TARGET-COMPUTER                      PIC X.
*
* BUFFER SIZES
*
 01  MAILBOX-MAX-BUFFER-SIZE                   PIC 9(4) VALUE 2000.
 01  LAN-MAX-BUFFER-SIZE                       PIC 9(4) VALUE 253.
*
* TERMINAL DESIGNATOR
*
 01  PORT-NAME                                 PIC X(12).
*
```

3.7.2 CPC Relationship

The items and constants listed in section 3.7.1.3 are used throughout COMM as a basis for decision making. The tables, however, are used only in specific CPC's that perform transformations. The table to process control characters in messages received from the remote COMM is used in KMINDA, the routine that compresses the data in the receiving buffer. The table exists in the include file CTLASC.INC for the non-IBM environment and CTLEBC.INC for the IBM computers. The table that is used in the longitudinal redundancy check calculation and to transform control characters for transmission is referenced in two routines: EXOUDA, Expand NTM Data, and KLCLRC, Calculate Longitudinal Redundancy Check. The table exists in the include file ASCII.INC for the non-IBM environment and in

EBCDIC.INC for IBM computers.

3.8 Object Code Creation

The generic portion of COMM is written in COBOL and has been successfully compiled on a VAX 11/780 under VMS, an IBM 3084 under MVS, and a Honeywell Level 6 under Mod 400.

The IHC's are routines that interface to the operating system of a particular computer. On the VAX they are written in COBOL and FORTRAN. On the IBM, they are written in Assembler. On the Honeywell Level 6, they are written in COBOL and Assembler. The IPC's are also routines that interface to the operating system. They are written in the same languages as the IHC's.

The minimum computer hardware and software required to create and run COMM in the IISS environment is documented in the Installation Guide for IISS on the VAX and in the Installation Guide for IISS on the IBM.

3.9 Adaption Data

In order to tailor COMM to either the VAX or the IBM, there are a few system dependent files required. For example, the tables for control character processing and calculation of the longitudinal redundancy check depend upon whether the native character set is ASCII or EBCDIC.

The other location for adaption data in COMM is in the initialization subroutine. The subroutine is tailored with initalization data for a specific terminal port; thus, there is one for each remote computer. This limitation could be removed with the implementation of system data storage in the Common Data Model.

The command procedures to the create COMM executable and the IPC library are specific to each computer and can be found under Software Configuration Management.

3.10 Detail Design Description

The upcoming program details were derived from all modules that were selected when the following Documentation Group(s) was chosen:

COMMVAX

3.10.1 Main Program List

The following is a list of all "Main Programs" which are modules that are not called by any other module being documented here. These modules are either program entry points or, if they are hooked into another set of programs via subroutine calls, they are the points the external programs can call and therefore enter through. To differentiate between the two types of entry points, look at the individual Module Documentation (section 3.10.8) and look at Module Type for each of the Main Program modules listed. Note whether the routine is a Program, Subroutine, or Function. If it is a Program, it is truly a main program entry point. If not, then it is merely called by other programs not being documented here.

COMM Main Program List

Module Name	Purpose
COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

3.10.2 Module List

The following is a list of all the modules being documented here along with their purpose. Each module has a unique name, no matter what language it was written in.

COMM Module List

Module Name	Purpose
ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
CNLLAN	CANCEL A LAN TERMINAL LINE RECEIVE
CNLTRM	CANCEL TERMINAL IO
COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
DACSES	REPORT A SESSION FAILURE TO NTM
EXOUDA	EXPAND NTM DATA IF CONTROL CHARS OR BINARY
GETLAN	GET A MESSAGE RECEIVED FROM A LAN TERMINAL LINE
GOUTMS	GET A MESSAGE FROM NTM
IDLINE	PROCESS INPUT OR TIMER RUNOUT
INILAN	INITIALIZE THE LAN TERMINAL INTERFACE
INITRM	INITIALIZE THE TERMINAL LINE
INTVH	INITIALIZE COMM VARIABLES
INTVI	INITIALIZE COMM VARIABLES
KLCLRC	CALCULATE LONGITUDINAL REDUNDANCY CHECK
KMINDA	COMPRESS THE DATA IN THE RECEIVE BUFFER
KPLXMT	PUT FINISHING TOUCHES ON MESSAGE TO LAN

COMM Module List

Module Name	Purpose
LBRESP	PROCESS RESPONSE TO LINE BID
LINBID	TRANSMIT A LINE BID MESSAGE
PARITY	SET CHANNEL TO EVEN PARITY
PINPMS	PROCESS MESSAGE FROM OTHER COMM
POUTMS	MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER
PURGE	CLEAR THE TYPE AHEAD BUFFER
RCV5H	RECEIVE 5 CURSORS FROM THE IBM
RCVIBM	READ TERMINAL LINE FROM PROTOCOL CONVERTER **
RCVLAN	RECEIVE FROM A LAN TERMINAL LINE
RCVTRM	READ TERMINAL LINE WITH EVENT FLAG
REPTER	REPORT RECOVERABLE ERROR TO NTM
SCTLMS	REPORT RECOVERABLE ERROR OR STATUS MSG TO NTM
SETCHR	SET TERMINAL CHARACTERISTICS
SETSPD	INITIALIZE THE TERMINAL SPEED
STRTIM	SET APPROPRIATE TIME INTERVAL AND START TIMER
TRCVH1	TEST 1ST BYTE IN HEADER OF RECEIVED MSG

COMM Module List

Module Name	Purpose
TRCVH2	TEST 2ND BYTE IN HEADER OF RECEIVED MSG
TRMLAN	RELEASE THE PORT TO THE LAN
UDRSQN	UPDATE RECEIVE SEQUENCE NUMBER
UDXSQN	UPDATE TRANSMIT SEQUENCE NUMBER
W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
XMTLAN	TRANSMIT TO A LAN TERMINAL LINE
XMTMSG	TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
XMTTRM	TRANSMIT TO THE TERMINAL LINE

3.10.3 External Routines List

The following is a list of all routines or functions not documented here that are called by modules that are documented here. The first caller, in alphabetical order, is listed as well. The specification in which any module is documented may be found in the Module Documentation Index (Document Number CM 620100001). See section 3.10.6 for a list of the modules that call each of these external routines.

COMM External Routines List

Module Name	First User
CNLTIM	ALINPS
DELMBX	COMVI
ERRPRO	INTVI
FREVTF	CNLLAN
GETMSG	GOUTMS
INICOM	INTVI
INSTNC	SCTLMS
LIB$GET_EF	RCVTRM
RCVMSG	INTVH
RELEVB	COMVI
SETTIM	PINPMS
SNDMSG	PINPMS
SYS$ALLOC	INITRM
SYS$ASSIGN	INITRM
SYS$CANCEL	CNLTRM
SYS$QIO	RCVIBM
SYS$QIOW	XMTTRM
SYS$SETPRI	RCVTRM
TRMNAX	COMVH
WAIT01	ACTSES
WAIT02	LBRESP
WAIT03	IDLINE

3.10.4 Include File List

The following is a list of all include files called in by modules being documented here. Each include file has a unique name regardless of the language being used. The purpose of each include file is listed as well. A more complete description of each include file is given in section 3.10.9. The purpose listed is the one that is in the source code of the include file.

A purpose of "**** PURPOSE NOT FOUND BY STRIPPER ****" indicates that a purpose statement was not written into the include file itself. The most common reason for this is that the include file comes from system libraries that were not developed by the project, such as 'C' libraries that are provided with the 'C' compiler.

See section 3.10.6 for a set of lists which show all the modules which call in each of these include files.

COMM Include File List

File Name	Purpose
ASCII	ASCII- INCLUDE FILE
CANHDR	CHKSTS.INC -- CHECK STATUS
CHKSTS	CHKSTS.INC -- CHECK STATUS
COMCON	COMCON - INCLUDE FILE
COMFLG	COMFLG - INCLUDE FILE
CTLASC	CTLASC - INCLUDE FILE
ERRPRO	PROCESS ERROR INCLUDE FILE
ERRSTS	ERRSTS.INC -- IISS ERROR CODES
ERRSTS.INF	**** PURPOSE NOT FOUND BY STRIPPER ****
LANEVB	LANEVB.INC -- LAN TERMINAL EVENT BLOCK DESCRIPTION
NHSNEB	NHSNEB - INCLUDE FILE
NLSNEB	NLSNEB - INCLUDE FILE
NRCVEB	NRCVEB - INCLUDE FILE
NTMHDR	NTMHDR - INCLUDE FILE
NTMINB	NTMINB - INCLUDE FILE
NTMOUB	NTMOUB - INCLUDE FILE
RCVBLK	RCVBLK - INCLUDE FILE
RPTERR	**** PURPOSE NOT FOUND BY STRIPPER ****
TIMEVB	TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
XMTBLK	XMTBLK - INCLUDE FILE

3.10.5 Where Include File Used List

The following lists each include file from 3.10.4 and all the modules documented in this specification which include them. The purpose of each module is listed as well.

COMM Where-include-file-used List

Include File	Module Name	Module Purpose
ASCII		
	EXOUDA	EXPAND NTM DATA IF CONTROL CHARS OR BINARY
	KLCLRC	CALCULATE LONGITUDINAL REDUNDANCY CHECK
CANHDR		
	SCTLMS	REPORT RECOVERABLE ERROR OR STATUS MSG TO NTM
CHKSTS		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	CNLLAN	CANCEL A LAN TERMINAL LINE RECEIVE
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	DACSES	REPORT A SESSION FAILURE TO NTM
	GETLAN	GET A MESSAGE RECEIVED FROM A LAN TERMINAL LINE
	GOUTMS	GET A MESSAGE FROM NTM
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	INILAN	INITIALIZE THE LAN TERMINAL INTERFACE
	INTVH	INITIALIZE COMM VARIABLES
	INTVI	INITIALIZE COMM VARIABLES
	KPLXMT	PUT FINISHING TOUCHES ON MESSAGE TO LAN
	LBRESP	PROCESS RESPONSE TO LINE BID
	LINBID	TRANSMIT A LINE BID MESSAGE
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
	POUTMS	MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER
	RCVLAN	RECEIVE FROM A LAN TERMINAL LINE
	REPTER	REPORT RECOVERABLE ERROR TO NTM
	SCTLMS	REPORT RECOVERABLE ERROR OR STATUS MSG TO NTM

COMM Where-include-file-used List

Include File	Module Name	Module Purpose
	STRTIM	SET APPROPRIATE TIME INTERVAL AND START TIMER
	W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
	XMTLAN	TRANSMIT TO A LAN TERMINAL LINE
	XMTMSG	TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
COMCON		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	DACSES	REPORT A SESSION FAILURE TO NTM
	EXOUDA	EXPAND NTM DATA IF CONTROL CHARS OR BINARY
	GOUTMS	GET A MESSAGE FROM NTM
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	INTVH	INITIALIZE COMM VARIABLES
	INTVI	INITIALIZE COMM VARIABLES
	KMINDA	COMPRESS THE DATA IN THE RECEIVE BUFFER
	KPLXMT	PUT FINISHING TOUCHES ON MESSAGE TO LAN
	LBRESP	PROCESS RESPONSE TO LINE BID
	LINBID	TRANSMIT A LINE BID MESSAGE
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
	POUTMS	MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER
	REPTER	REPORT RECOVERABLE ERROR TO NTM
	STRTIM	SET APPROPRIATE TIME INTERVAL AND START TIMER
	TRCVH1	TEST 1ST BYTE IN HEADER OF RECEIVED MSG
	TRCVH2	TEST 2ND BYTE IN HEADER OF RECEIVED MSG
	UDRSQN	UPDATE RECEIVE SEQUENCE NUMBER
	UDXSQN	UPDATE TRANSMIT SEQUENCE NUMBER
	W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
	XMTMSG	TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER

COMM Where-include-file-used List

Include File	Module Name	Module Purpose
COMFLG		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	DACSES	REPORT A SESSION FAILURE TO NTM
	EXOUDA	EXPAND NTM DATA IF CONTROL CHARS OR BINARY
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	INTVH	INITIALIZE COMM VARIABLES
	INTVI	INITIALIZE COMM VARIABLES
	KLCLRC	CALCULATE LONGITUDINAL REDUNDANCY CHECK
	KMINDA	COMPRESS THE DATA IN THE RECEIVE BUFFER
	KPLXMT	PUT FINISHING TOUCHES ON MESSAGE TO LAN
	LBRESP	PROCESS RESPONSE TO LINE BID
	LINBID	TRANSMIT A LINE BID MESSAGE
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
	POUTMS	MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER
	RCVLAN	RECEIVE FROM A LAN TERMINAL LINE
	REPTER	REPORT RECOVERABLE ERROR TO NTM
	SCTLMS	REPORT RECOVERABLE ERROR OR STATUS MSG TO NTM
	STRTIM	SET APPROPRIATE TIME INTERVAL AND START TIMER
	W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
	XMTLAN	TRANSMIT TO A LAN TERMINAL LINE
	XMTMSG	TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
CTLASC		
	KMINDA	COMPRESS THE DATA IN THE RECEIVE BUFFER

COMM Where-include-file-used List

Include File	Module Name	Module Purpose
ERRPRO		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	CNLLAN	CANCEL A LAN TERMINAL LINE RECEIVE
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	DACSES	REPORT A SESSION FAILURE TO NTM
	EXOUDA	EXPAND NTM DATA IF CONTROL CHARS OR BINARY
	GETLAN	GET A MESSAGE RECEIVED FROM A LAN TERMINAL LINE
	GOUTMS	GET A MESSAGE FROM NTM
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	INTVH	INITIALIZE COMM VARIABLES
	INTVI	INITIALIZE COMM VARIABLES
	KPLXMT	PUT FINISHING TOUCHES ON MESSAGE TO LAN
	LBRESP	PROCESS RESPONSE TO LINE BID
	LINBID	TRANSMIT A LINE BID MESSAGE
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
	POUTMS	MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER
	RCVLAN	RECEIVE FROM A LAN TERMINAL LINE
	REPTER	REPORT RECOVERABLE ERROR TO NTM
	SCTLMS	REPORT RECOVERABLE ERROR OR STATUS MSG TO NTM
	STRTIM	SET APPROPRIATE TIME INTERVAL AND START TIMER
	W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
	XMTLAN	TRANSMIT TO A LAN TERMINAL LINE
	XMTMSG	TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
ERRSTS		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM

COMM Where-include-file-used List

Include File	Module Name	Module Purpose
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	CNLLAN	CANCEL A LAN TERMINAL LINE RECEIVE
	DACSES	REPORT A SESSION FAILURE TO NTM
	EXOUDA	EXPAND NTM DATA IF CONTROL CHARS OR BINARY
	GETLAN	GET A MESSAGE RECEIVED FROM A LAN TERMINAL LINE
	GOUTMS	GET A MESSAGE FROM NTM
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	INILAN	INITIALIZE THE LAN TERMINAL INTERFACE
	LBRESP	PROCESS RESPONSE TO LINE BID
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
	POUTMS	MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER
	RCVLAN	RECEIVE FROM A LAN TERMINAL LINE
	REPTER	REPORT RECOVERABLE ERROR TO NTM
	TRCVH1	TEST 1ST BYTE IN HEADER OF RECEIVED MSG
	TRCVH2	TEST 2ND BYTE IN HEADER OF RECEIVED MSG
	W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
	XMTLAN	TRANSMIT TO A LAN TERMINAL LINE
	XMTMSG	TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER

ERRSTS.INF

	CNLTRM	CANCEL TERMINAL IO
	INITRM	INITIALIZE THE TERMINAL LINE
	PARITY	SET CHANNEL TO EVEN PARITY
	PURGE	CLEAR THE TYPE AHEAD BUFFER
	RCV5H	RECEIVE 5 CURSORS FROM THE IBM
	RCVIBM	READ TERMINAL LINE FROM PROTOCOL CONVERTER **
	RCVTRM	READ TERMINAL LINE WITH EVENT FLAG

COMM Where-include-file-used List

Include File	Module Name	Module Purpose
	SETCHR	SET TERMINAL CHARACTERISTICS
	SETSPD	INITIALIZE THE TERMINAL SPEED
	XMTTRM	TRANSMIT TO THE TERMINAL LINE
LANEVB		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	CNLLAN	CANCEL A LAN TERMINAL LINE RECEIVE
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	GETLAN	GET A MESSAGE RECEIVED FROM A LAN TERMINAL LINE
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	INILAN	INITIALIZE THE LAN TERMINAL INTERFACE
	INTVH	INITIALIZE COMM VARIABLES
	INTVI	INITIALIZE COMM VARIABLES
	KPLXMT	PUT FINISHING TOUCHES ON MESSAGE TO LAN
	LBRESP	PROCESS RESPONSE TO LINE BID
	LINBID	TRANSMIT A LINE BID MESSAGE
	RCVLAN	RECEIVE FROM A LAN TERMINAL LINE
	TRMLAN	RELEASE THE PORT TO THE LAN
	W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
	XMTLAN	TRANSMIT TO A LAN TERMINAL LINE
	XMTMSG	TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
NHSNEB		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Where-include-file-used List

Include File	Module Name	Module Purpose
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	DACSES	REPORT A SESSION FAILURE TO NTM
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	LBRESP	PROCESS RESPONSE TO LINE BID
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
	REPTER	REPORT RECOVERABLE ERROR TO NTM
	SCTLMS	REPORT RECOVERABLE ERROR OR STATUS MSG TO NTM
	W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
NLSNEB		
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	LBRESP	PROCESS RESPONSE TO LINE BID
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
NRCVEB		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	GOUTMS	GET A MESSAGE FROM NTM
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	INTVH	INITIALIZE COMM VARIABLES
	INTVI	INITIALIZE COMM VARIABLES
	LBRESP	PROCESS RESPONSE TO LINE BID
	POUTMS	MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER

COMM Where-include-file-used List

Include File	Module Name	Module Purpose
NTMHDR		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	EXOUDA	EXPAND NTM DATA IF CONTROL CHARS OR BINARY
	GOUTMS	GET A MESSAGE FROM NTM
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
	POUTMS	MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER
NTMINB		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	INTVH	INITIALIZE COMM VARIABLES
	INTVI	INITIALIZE COMM VARIABLES
	KMINDA	COMPRESS THE DATA IN THE RECEIVE BUFFER
	LBRESP	PROCESS RESPONSE TO LINE BID
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
NTMOUB		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	EXOUDA	EXPAND NTM DATA IF CONTROL CHARS OR BINARY
	GOUTMS	GET A MESSAGE FROM NTM

COMM Where-include-file-used List

Include File	Module Name	Module Purpose
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	INTVH	INITIALIZE COMM VARIABLES
	INTVI	INITIALIZE COMM VARIABLES
	LBRESP	PROCESS RESPONSE TO LINE BID
	POUTMS	MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER
RCVBLK		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	CNLLAN	CANCEL A LAN TERMINAL LINE RECEIVE
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	GETLAN	GET A MESSAGE RECEIVED FROM A LAN TERMINAL LINE
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	INILAN	INITIALIZE THE LAN TERMINAL INTERFACE
	INTVH	INITIALIZE COMM VARIABLES
	INTVI	INITIALIZE COMM VARIABLES
	KMINDA	COMPRESS THE DATA IN THE RECEIVE BUFFER
	KPLXMT	PUT FINISHING TOUCHES ON MESSAGE TO LAN
	LBRESP	PROCESS RESPONSE TO LINE BID
	LINBID	TRANSMIT A LINE BID MESSAGE
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
	RCVLAN	RECEIVE FROM A LAN TERMINAL LINE
	TRCVH1	TEST 1ST BYTE IN HEADER OF RECEIVED MSG
	TRCVH2	TEST 2ND BYTE IN HEADER OF RECEIVED MSG
	TRMLAN	RELEASE THE PORT TO THE LAN
	UDRSQN	UPDATE RECEIVE SEQUENCE NUMBER
	W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
	XMTMSG	TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
RPTERR		

COMM Where-include-file-used List

Include File	Module Name	Module Purpose
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	LBRESP	PROCESS RESPONSE TO LINE BID
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
TIMEVB		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	KPLXMT	PUT FINISHING TOUCHES ON MESSAGE TO LAN
	LBRESP	PROCESS RESPONSE TO LINE BID
	LINBID	TRANSMIT A LINE BID MESSAGE
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
	STRTIM	SET APPROPRIATE TIME INTERVAL AND START TIMER
	W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
	XMTMSG	TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
XMTBLK		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	EXOUDA	EXPAND NTM DATA IF CONTROL CHARS OR BINARY
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	INILAN	INITIALIZE THE LAN TERMINAL INTERFACE
	INTVH	INITIALIZE COMM VARIABLES
	INTVI	INITIALIZE COMM VARIABLES
	KPLXMT	PUT FINISHING TOUCHES ON MESSAGE TO LAN

COMM Where-include-file-used List

Include File	Module Name	Module Purpose
	LBRESP	PROCESS RESPONSE TO LINE BID
	LINBID	TRANSMIT A LINE BID MESSAGE
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
	POUTMS	MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER
	TRCVH2	TEST 2ND BYTE IN HEADER OF RECEIVED MSG
	TRMLAN	RELEASE THE PORT TO THE LAN
	UDXSQN	UPDATE TRANSMIT SEQUENCE NUMBER
	W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
	XMTLAN	TRANSMIT TO A LAN TERMINAL LINE
	XMTMSG	TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER

3.10.6 Where External Routine Used List

The following lists each external function or routine listed in 3.10.3 and all the documented modules which call it. The purpose of each module is listed as well.

COMM Where-external-routine-used List

System Module	Module Name	Module Purpose
CNLTIM		
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	KPLXMT	PUT FINISHING TOUCHES ON MESSAGE TO LAN
	LBRESP	PROCESS RESPONSE TO LINE BID
	W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
DELMBX		
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
ERRPRO		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	ALRESP	RESPOND TO MESSAGE FROM OTHER COMM
	CNLLAN	CANCEL A LAN TERMINAL LINE RECEIVE
	CNLTRM	CANCEL TERMINAL IO
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	DACSES	REPORT A SESSION FAILURE TO NTM
	EXOUDA	EXPAND NTM DATA IF CONTROL CHARS OR BINARY
	GETLAN	GET A MESSAGE RECEIVED FROM A LAN TERMINAL LINE
	GOUTMS	GET A MESSAGE FROM NTM
	IDLINE	PROCESS INPUT OR TIMER RUNOUT
	INITRM	INITIALIZE THE TERMINAL LINE
	INTVH	INITIALIZE COMM VARIABLES
	INTVI	INITIALIZE COMM VARIABLES
	KPLXMT	PUT FINISHING TOUCHES ON MESSAGE TO LAN
	LBRESP	PROCESS RESPONSE TO LINE BID
	LINBID	TRANSMIT A LINE BID MESSAGE
	PARITY	SET CHANNEL TO EVEN PARITY
	PINPMS	PROCESS MESSAGE FROM OTHER COMM

COMM Where-external-routine-used List

System Module	Module Name	Module Purpose
	POUTMS	MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER
	PURGE	CLEAR THE TYPE AHEAD BUFFER
	RCV5H	RECEIVE 5 CURSORS FROM THE IBM
	RCVIBM	READ TERMINAL LINE FROM PROTOCOL CONVERTER **
	RCVLAN	RECEIVE FROM A LAN TERMINAL LINE
	RCVTRM	READ TERMINAL LINE WITH EVENT FLAG
	REPTER	REPORT RECOVERABLE ERROR TO NTM
	SCTLMS	REPORT RECOVERABLE ERROR OR STATUS MSG TO NTM
	SETSPD	INITIALIZE THE TERMINAL SPEED
	STRTIM	SET APPROPRIATE TIME INTERVAL AND START TIMER
	W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
	XMTLAN	TRANSMIT TO A LAN TERMINAL LINE
	XMTMSG	TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
	XMTTRM	TRANSMIT TO THE TERMINAL LINE
FREVTF		
	CNLLAN	CANCEL A LAN TERMINAL LINE RECEIVE
	GETLAN	GET A MESSAGE RECEIVED FROM A LAN TERMINAL LINE
GETMSG		
	GOUTMS	GET A MESSAGE FROM NTM
INICOM		
	INTVH	INITIALIZE COMM VARIABLES

COMM Where-external-routine-used List

System Module	Module Name	Module Purpose
	INTVI	INITIALIZE COMM VARIABLES
INSTNC		
	SCTLMS	REPORT RECOVERABLE ERROR OR STATUS MSG TO NTM
LIB$GET_EF		
	RCVIBM	READ TERMINAL LINE FROM PROTOCOL CONVERTER **
	RCVTRM	READ TERMINAL LINE WITH EVENT FLAG
RCVMSG		
	GOUTMS	GET A MESSAGE FROM NTM
	INTVH	INITIALIZE COMM VARIABLES
	INTVI	INITIALIZE COMM VARIABLES
RELEVB		
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
SETTIM		
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
	STRTIM	SET APPROPRIATE TIME INTERVAL AND START TIMER
SNDMSG		
	PINPMS	PROCESS MESSAGE FROM OTHER COMM

COMM Where-external-routine-used List

System Module	Module Name	Module Purpose
	SCTLMS	REPORT RECOVERABLE ERROR OR STATUS MSG TO NTM
SYS$ALLOC		
	INITRM	INITIALIZE THE TERMINAL LINE
SYS$ASSIGN		
	INITRM	INITIALIZE THE TERMINAL LINE
SYS$CANCEL		
	CNLTRM	CANCEL TERMINAL IO
SYS$QIO		
	RCV5H	RECEIVE 5 CURSORS FROM THE IBM
	RCVIBM	READ TERMINAL LINE FROM PROTOCOL CONVERTER **
	RCVTRM	READ TERMINAL LINE WITH EVENT FLAG
SYS$QIOW		
	PARITY	SET CHANNEL TO EVEN PARITY
	PURGE	CLEAR THE TYPE AHEAD BUFFER
	SETCHR	SET TERMINAL CHARACTERISTICS

COMM Where-external-routine-used List

System Module	Module Name	Module Purpose
	SETSPD	INITIALIZE THE TERMINAL SPEED
	XMTTRM	TRANSMIT TO THE TERMINAL LINE
SYS$SETPRI		
	RCVIBM	READ TERMINAL LINE FROM PROTOCOL CONVERTER **
	RCVTRM	READ TERMINAL LINE WITH EVENT FLAG
	XMTTRM	TRANSMIT TO THE TERMINAL LINE
TRMNAX		
	COMVH	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	COMVI	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
WAIT01		
	ACTSES	ACTIVATE SESSION IF REQUESTED TO BY NTM
	PINPMS	PROCESS MESSAGE FROM OTHER COMM
WAIT02		
	ALINPS	WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
	LBRESP	PROCESS RESPONSE TO LINE BID
	W1RESP	WAIT FOR THE FIRST MESSAGE ON THE LAN
WAIT03		
	IDLINE	PROCESS INPUT OR TIMER RUNOUT

COMM Where-external-routine-used List

System Module	Module Name	Module Purpose

3.10.7 Main Program Parts List

The following lists each Main Program listed in 3.10.1 and all the modules which are called either by that module itself or by any of the documented modules which it calls. It is possible for a non-main module to be listed more that once if it is called by multiple modules. The called modules, in this case known as program parts, are marked as to whether they are documented here. If so, the phrase "well-defined module" appears by the module name, if not it is an "external "routine". The Purpose of the Main Program module is listed as well.

COMM Main Program Parts List

Main Pgm Name	Module Name	Module Type
COMVH	Purpose-->	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	ACTSES	Well-defined module
	ALINPS	Well-defined module
	ALRESP	Well-defined module
	CNLLAN	Well-defined module
	CNLTIM	External routine
	CNLTRM	Well-defined module
	DACSFS	Well-defined module
	DELMBX	External routine
	ERRPRO	External routine
	EXOUDA	Well-defined module
	FREVTF	External routine
	GETLAN	Well-defined module
	GETMSG	External routine
	GOUTMS	Well-defined module
	IDLINE	Well-defined module
	INICOM	External routine
	INILAN	Well-defined module
	INITRM	Well-defined module
	INSTNC	External routine
	INTVH	Well-defined module
	KLCLRC	Well-defined module
	KMINDA	Well-defined module
	KPLXMT	Well-defined module
	LBRESP	Well-defined module
	LIB$GET_EF	External routine
	LINBID	Well-defined module
	PARITY	Well-defined module
	PINPMS	Well-defined module
	POUTMS	Well-defined module
	PURGE	Well-defined module
	RCV5H	Well-defined module
	RCVIBM	Well-defined module
	RCVLAN	Well-defined module
	RCVMSG	External routine
	RCVTRM	Well-defined module
	RELEVB	External routine
	REPTER	Well-defined module
	SCTLMS	Well-defined module

COMM Main Program Parts List

Main Pgm Name	Module Name	Module Type
	SETCHR	Well-defined module
	SETSPD	Well-defined module
	SETTIM	External routine
	SNDMSG	External routine
	STRTIM	Well-defined module
	SYS$ALLOC	External routine
	SYS$ASSIGN	External routine
	SYS$CANCEL	External routine
	SYS$QIO	External routine
	SYS$QIOW	External routine
	SYS$SETPRI	External routine
	TRCVH1	Well-defined module
	TRCVH2	Well-defined module
	TRMLAN	Well-defined module
	TRMNAX	External routine
	UDRSQN	Well-defined module
	UDXSQN	Well-defined module
	W1RESP	Well-defined module
	WAIT01	External routine
	WAIT02	External routine
	WAIT03	External routine
	XMTLAN	Well-defined module
	XMTMSG	Well-defined module
	XMTTRM	Well-defined module

COMM Main Program Parts List

Main Pgm Name	Module Name	Module Type
COMVI	Purpose-->	MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
	ACTSES	Well-defined module
	ALINPS	Well-defined module
	ALRESP	Well-defined module
	CNLLAN	Well-defined module
	CNLTIM	External routine
	CNLTRM	Well-defined module
	DACSES	Well-defined module
	DELMBX	External routine
	ERRPRO	External routine
	EXOUDA	Well-defined module
	FREVTF	External routine
	GETLAN	Well-defined module
	GETMSG	External routine
	GOUTMS	Well-defined module
	IDLINE	Well-defined module
	INICOM	External routine
	INILAN	Well-defined module
	INITRM	Well-defined module
	INSTNC	External routine
	INTVI	Well-defined module
	KLCLRC	Well-defined module
	KMINDA	Well-defined module
	KPLXMT	Well-defined module
	LBRESP	Well-defined module
	LIB$GET_EF	External routine
	LINBID	Well-defined module
	PARITY	Well-defined module
	PINPMS	Well-defined module
	POUTMS	Well-defined module
	PURGE	Well-defined module
	RCV5H	Well-defined module
	RCVIBM	Well-defined module
	RCVLAN	Well-defined module
	RCVMSG	External routine
	RCVTRM	Well-defined module
	RELEVB	External routine
	REPTER	Well-defined module
	SCTLMS	Well-defined module

COMM Main Program Parts List

Main Pgm Name	Module Name	Module Type
	SETCHR	Well-defined module
	SETSPD	Well-defined module
	SETTIM	External routine
	SNDMSG	External routine
	STRTIM	Well-defined module
	SYS$ALLOC	External routine
	SYS$ASSIGN	External routine
	SYS$CANCEL	External routine
	SYS$QIO	External routine
	SYS$QIOW	External routine
	SYS$SETPRI	External routine
	TRCVH1	Well-defined module
	TRCVH2	Well-defined module
	TRMLAN	Well-defined module
	TRMNAX	External routine
	UDRSQN	Well-defined module
	UDXSQN	Well-defined module
	W1RESP	Well-defined module
	WAIT01	External routine
	WAIT02	External routine
	WAIT03	External routine
	XMTLAN	Well-defined module
	XMTMSG	Well-defined module
	XMTTRM	Well-defined module

3.10.8 Module Documentation

The following documentation describes information which is specific to each individual module being documented in this specification as listed in section 3.10.2. It provides a compact way of getting information that would be otherwise buried within each module's source code.

The specific items in this module documentation have the following meanings:

NAME:	Name of program Module.
PURPOSE:	Purpose of Module as detailed in the source code.
LANGUAGE:	Programming language source code is written in. The choices are: VAX-11 FORTRAN C (I/S-1 Workbench 'C') VAX-11 COBOL
MODULE TYPE:	Whether a Program, Subroutine, or Function.
SOURCE FILE:	Name of Source File from file specification.
SOURCE FILE TYPE:	Source File Extension from file specification.
HOST:	Whether this is a host-dependent routine (VAX or IBM) or blank if host-independent.
SUBSYSTEM:	IISS sub-system this file resides in.
SUBDIRECTORY:	Sub-directory of that subsystem in which this file resides.
DOCUMENTATION GROUP:	Name of documentation group of which this source file is a member.
DESCRIPTION:	A description of the module as otained from the source code.
ARGUMENTS:	The arguments with which this routine is called if it is a Subroutine or a Function.
INCLUDE FILES:	A list of all the files that are included into this module as well as their purposes.
ROUTINES CALLED:	Subroutines or Functions, either documented or external, called by

this module, if any.

CALLED DIRECTLY BY: The documented routines which call this module, if any.

USED IN MAIN PROGRAM(S): The documented Main Programs which contain this module in their parts list according to the list in section 3.10.7.

The Module Documentation is arranged alphabetically according to Module Name.

COMM Module Documentation

NAME: ACTSES
PURPOSE: ACTIVATE SESSION IF REQUESTED TO BY NTM
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: ACTSES
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- ACTSES WAITS TO RECEIVE A MESSAGE FROM NTM.
IF THE MESSAGE IS 'START A SESSION',
ACTSES INITIATES THE PROCEDURE TO HANDLE
THE LOCAL AREA NETWORK COMMUNICATIONS.
IF THE MESSAGE IS 'TERMINATE THE SESSION',
THAT REQUEST IS NOTED HERE BUT PROCESSED
BY THE MAIN MODULE. ANY OTHER REQUEST
FROM NTM IS CONSIDERED AN ERROR.

ANY BAD STATUS CONDITIONS IN THIS ROUTINE
ARE FATAL TO COMM.

-

ARGUMENTS:

LAN-EVENT-BLOCK = RECRD
NTM-RCV-EVENT-BLOCK = DSPLY [X(2032)]
TIMER-EVENT-BLOCK = RECRD
NTM-SEND-EVENT-BLOCK-H = DSPLY [X(2032)]
XMIT-BLOCK = RECRD
RCV-BLOCK = RECRD
INPUT-MAILBOX-NAME = DSPLY [X(14)]
TARGET-MAILBOX-NAME-H = DSPLY [X(14)]
FLAGS = RECRD
NTM-OUTPUT-BLOCK = RECRD
NTM-INPUT-MSG-POSITION = DSPLY [9(4)]
NTM-INPUT-MSG = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

COMCON - COMCON - INCLUDE FILE
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
CHKSTS - CHKSTS.INC -- CHECK STATUS
LANEVB - LANEVB.INC -- LAN TERMINAL EVENT BLOCK
DESCRIPTION
NRCVEB - NRCVEB - INCLUDE FILE
TIMEVB - TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
NHSNEB - NHSNEB - INCLUDE FILE

```
  XMTBLK      - XMTBLK - INCLUDE FILE
  RCVBLK      - RCVBLK - INCLUDE FILE
  COMFLG      - COMFLG - INCLUDE FILE
  NTMOUB      - NTMOUB - INCLUDE FILE
  NTMHDR      - NTMHDR - INCLUDE FILE
  NTMINB      - NTMINB - INCLUDE FILE
  RPTERR      - **** PURPOSE NOT FOUND BY STRIPPER ****
  ERRPRO      - PROCESS ERROR INCLUDE FILE
```

ROUTINES CALLED:

```
  WAIT01
  GOUTMS      - GET A MESSAGE FROM NTM
  XMTMSG      - TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
  W1RESP      - WAIT FOR THE FIRST MESSAGE ON THE LAN
  REPTER      - REPORT RECOVERABLE ERROR TO NTM
  ERRPRO
```

CALLED DIRECTLY BY:

```
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

USED IN MAIN PROGRAM(S):

```
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

COMM Module Documentation

NAME: ALINPS
PURPOSE: WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: ALINPS
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- ALINPS WAITS FOR EITHER THE TIMER TO RUN OUT OR FOR A MESSAGE FROM THE COMM ON THE OTHER COMPUTER. IF THE TIMER RUNS OUT, ALINPS CANCELS THE OUTSTANDING RECEIVE ON THE LAN PORT. IF COMM IS MASTER, ALINPS CAUSES THE ORIGINAL MESSAGE TO BE RETRANSMITTED. IF COMM IS SLAVE AND THERE IS DATA TO BE SENT TO THE COMM ON THE OTHER COMPUTER, ALINPS SETS THE RETRY COUNT TO CAUSE THE SESSION TO BE TERMINATED. IF THERE IS NO DATA TO BE SENT, ALINPS CHANGES THE STATE OF COMM TO SESSION ACTIVE, LINE IDLE.

IF ALINPS RECEIVES A MESSAGE FROM THE COMM ON THE OTHER COMPUTER, IT CALLS ALRESP TO SEND A RESPONSE.

ANY BAD STATUS CONDITIONS IN THIS ROUTINE ARE FATAL TO COMM.

-

ARGUMENTS:

LAN-EVENT-BLOCK = RECRD
NTM-RCV-EVENT-BLOCK = DSPLY [X(2032)]
TIMER-EVENT-BLOCK = RECRD
NTM-SEND-EVENT-BLOCK-H = DSPLY [X(2032)]
NTM-SEND-EVENT-BLOCK-L = DSPLY [X(2032)]
XMIT-BLOCK = RECRD
RCV-BLOCK = RECRD
INPUT-MAILBOX-NAME = DSPLY [X(14)]
TARGET-MAILBOX-NAME-H = DSPLY [X(14)]
TARGET-MAILBOX-NAME-L = DSPLY [X(14)]
FLAGS = RECRD
NTM-OUTPUT-BLOCK = RECRD
NTM-INPUT-MSG-POSITION = DSPLY [9(4)]
NTM-INPUT-MSG = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

COMCON	- COMCON - INCLUDE FILE
ERRSTS	- ERRSTS.INC -- IISS ERROR CODES
CHKSTS	- CHKSTS.INC -- CHECK STATUS
LANEVB	- LANEVB.INC -- LAN TERMINAL EVENT BLOCK DESCRIPTION
NRCVEB	- NRCVEB - INCLUDE FILE
TIMEVB	- TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
NHSNEB	- NHSNEB - INCLUDE FILE
NLSNEB	- NLSNEB - INCLUDE FILE
XMTBLK	- XMTBLK - INCLUDE FILE
RCVBLK	- RCVBLK - INCLUDE FILE
COMFLG	- COMFLG - INCLUDE FILE
NTMOUB	- NTMOUB - INCLUDE FILE
NTMINB	- NTMINB - INCLUDE FILE
RPTERR	- **** PURPOSE NOT FOUND BY STRIPPER ****
ERRPRO	- PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

WAIT02	
CNLTIM	
GETLAN	- GET A MESSAGE RECEIVED FROM A LAN TERMINAL LINE
ALRESP	- RESPOND TO MESSAGE FROM OTHER COMM
CNLLAN	- CANCEL A LAN TERMINAL LINE RECEIVE
XMTMSG	- TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
RCVLAN	- RECEIVE FROM A LAN TERMINAL LINE
REPTER	- REPORT RECOVERABLE ERROR TO NTM
ERRPRO	

CALLED DIRECTLY BY:

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

```
NAME:                   ALRESP
PURPOSE:                RESPOND TO MESSAGE FROM OTHER COMM
LANGUAGE:               VAX-11 COBOL
MODULE TYPE:            SUBROUTINE
SOURCE FILE:            ALRESP
SOURCE FILE TYPE:       .COB
HOST:
SUBSYSTEM:              COMM
SUBDIRECTORY:
DOCUMENTATION GROUP:    COMM

DESCRIPTION:
------------
  - ALRESP CHECKS FIRST FOR AN END OF TRANSMISSION
  OR LINE BID MESSAGE FROM COMM ON THE OTHER
  COMPUTER.  IF THE MESSAGE IS EITHER EOT
  OR LINE BID, ALRESP CHANGES THE STATE OF
  COMM TO SESSION ACTIVE, LINE IDLE.
  IF THE MESSAGE IS NEITHER, ALRESP
  VALIDATES THE INCOMING MESSAGE.  IF COMM
  HAD SENT A MESSAGE TO COMM ON THE OTHER COMPUTER,
  ALRESP CHECKS THAT IT WAS RECEIVED.  IF IT WAS
  NOT, THE MESSAGE IS RETRANSMITTED.  IF IT WAS,
  THE NEXT BLOCK OF DATA IS SENT IF THERE IS ONE.

  ANY BAD STATUS CONDITIONS IN THIS ROUTINE ARE
  FATAL TO COMM.

   -

ARGUMENTS:
----------
  LAN-EVENT-BLOCK = RECRD
  NTM-RCV-EVENT-BLOCK = DSPLY [X(2032)]
  TIMER-EVENT-BLOCK = RECRD
  NTM-SEND-EVENT-BLOCK-H = DSPLY [X(2032)]
  NTM-SEND-EVENT-BLOCK-L = DSPLY [X(2032)]
  XMIT-BLOCK = RECRD
  RCV-BLOCK = RECRD
  INPUT-MAILBOX-NAME = DSPLY [X(14)]
  TARGET-MAILBOX-NAME-H = DSPLY [X(14)]
  TARGET-MAILBOX-NAME-L = DSPLY [X(14)]
  FLAGS = RECRD
  NTM-OUTPUT-BLOCK = RECRD
  NTM-INPUT-MSG-POSITION = DSPLY [9(4)]
  NTM-INPUT-MSG = RECRD
  RET-STATUS = DSPLY [X(5)]


INCLUDE FILES:
--------------
  COMCON      - COMCON - INCLUDE FILE
  CHKSTS      - CHKSTS.INC -- CHECK STATUS
  ERRSTS      - ERRSTS.INC -- IISS ERROR CODES
```

```
  LANEVB      - LANEVB.INC -- LAN TERMINAL EVENT BLOCK
                      DESCRIPTION
  NRCVEB      - NRCVEB - INCLUDE FILE
  TIMEVB      - TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
  NHSNEB      - NHSNEB - INCLUDE FILE
  NLSNEB      - NLSNEB - INCLUDE FILE
  XMTBLK      - XMTBLK - INCLUDE FILE
  RCVBLK      - RCVBLK - INCLUDE FILE
  COMFLG      - COMFLG - INCLUDE FILE
  NTMOUB      - NTMOUB - INCLUDE FILE
  NTMINB      - NTMINB - INCLUDE FILE
  RPTERR      - **** PURPOSE NOT FOUND BY STRIPPER ****
  ERRPRO      - PROCESS ERROR INCLUDE FILE
```

ROUTINES CALLED:

```
  RCVLAN      - RECEIVE FROM A LAN TERMINAL LINE
  TRCVH2      - TEST 2ND BYTE IN HEADER OF RECEIVED MSG
  PINPMS      - PROCESS MESSAGE FROM OTHER COMM
  POUTMS      - MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER
  UDXSQN      - UPDATE TRANSMIT SEQUENCE NUMBER
  KPLXMT      - PUT FINISHING TOUCHES ON MESSAGE TO LAN
  REPTER      - REPORT RECOVERABLE ERROR TO NTM
  ERRPRO
```

CALLED DIRECTLY BY:

```
  ALINPS      - WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
  LBRESP      - PROCESS RESPONSE TO LINE BID
```

USED IN MAIN PROGRAM(S):

```
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

COMM Module Documentation

```
NAME:                   CNLLAN
PURPOSE:                CANCEL A LAN TERMINAL LINE RECEIVE
LANGUAGE:               VAX-11 COBOL
MODULE TYPE:            SUBROUTINE
SOURCE FILE:            CNLLAN
SOURCE FILE TYPE:       .COB
HOST:                   VAX
SUBSYSTEM:              COMM
SUBDIRECTORY:
DOCUMENTATION GROUP:    COMM

DESCRIPTION:
------------
   CANCEL AN OUTSTANDING LAN RECEIVE REQUEST.



ARGUMENTS:
----------
  RCV-BLOCK = RECRD
  LAN-EVENT-BLOCK = RECRD
  RET-STATUS = DSPLY [X(5)]


INCLUDE FILES:
--------------
  CHKSTS      - CHKSTS.INC -- CHECK STATUS
  ERRSTS      - ERRSTS.INC -- IISS ERROR CODES
  RCVBLK      - RCVBLK - INCLUDE FILE
  LANEVB      - LANEVB.INC -- LAN TERMINAL EVENT BLOCK
                      DESCRIPTION
  ERRPRO      - PROCESS ERROR INCLUDE FILE


ROUTINES CALLED:
----------------
  CNLTRM      -  CANCEL TERMINAL IO                          **
  FREVTF
  ERRPRO


CALLED DIRECTLY BY:
-------------------
  ALINPS      - WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
  IDLINE      - PROCESS INPUT OR TIMER RUNOUT
  LBRESP      - PROCESS RESPONSE TO LINE BID
  W1RESP      - WAIT FOR THE FIRST MESSAGE ON THE LAN


USED IN MAIN PROGRAM(S):
------------------------
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

COMM Module Documentation

NAME: CNLTRM
PURPOSE: CANCEL TERMINAL IO
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: CNLTRM
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

CANCEL A RECEIVE TO A TERMINAL LINE

ARGUMENTS:

CHANNL = I*2
- TERMINAL CHANNEL NUMBER

RSTATS = CHAR
- RETURN STATUS

INCLUDE FILES:

ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

ERRPRO
SYS$CANCEL

CALLED DIRECTLY BY:

CNLLAN - CANCEL A LAN TERMINAL LINE RECEIVE

USED IN MAIN PROGRAM(S):

COMVH - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: COMVH
PURPOSE: MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
LANGUAGE: VAX-11 COBOL
MODULE TYPE: PROGRAM
SOURCE FILE: COMVH
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- COMM IS ALWAYS IN ONE OF FOUR STATES.
1. SESSION INACTIVE - COMM IS EXECUTING BUT IT HAS NOT ESTABLISHED COMMUNICATIONS WITH THE NTM YET.
2. SESSION ACTIVE, LINE IDLE - COMM AND NTM HAVE ESTABLISHED COMMUNICATIONS BUT NTM HAS NO MESSAGES TO SEND AND COMM IS NOT RECEIVING ANY MESSAGES FROM THE COMM ON THE OTHER COMPUTER.
3. SESSION ACTIVE, LINE BID - NTM HAS REQUESTED THAT A MESSAGE BE SENT ACROSS THE LOCAL AREA NETWORK TO THE OTHER COMPUTER AND COMM IS REQUESTING PERMISSION FROM THE COMM ON THE OTHER COMPUTER TO BECOME MASTER OF THE LAN LINE.
4. SESSION ACTIVE, LINE ACTIVE - COMM IS RECEIVING A MESSAGE FROM THE COMM ON THE OTHER COMPUTER AND MUST SEND IT TO THE NTM AFTER REASSEMBLY, IF REQUIRED, IS DONE; OR, COMM IS SENDING A MESSAGE TO THE COMM ON THE OTHER COMPUTER FOR NTM.

THE MAIN MODULE LOOPS FOREVER DETERMINING THE STATE OF COMM AND PERFORMING THE REQUIRED PROCESSING. FOREVER ENDS IF AN ERROR OCCURS OR IF NTM REQUESTS COMM TO TERMINATE, AT WHICH TIME COMM SHUTS ITSELF DOWN. IF COMM IS EXPERIENCING DIFFICULTIES GETTING SUCCESSFUL TRANSMISSION RESPONSES FROM THE COMM ON THE OTHER COMPUTER, IT WILL PLACE ITSELF IN THE SESSION INACTIVE STATE.

-

INCLUDE FILES:

COMCON - COMCON - INCLUDE FILE
LANEVB - LANEVB.INC -- LAN TERMINAL EVENT BLOCK DESCRIPTION

```
   NRCVEB      - NRCVEB - INCLUDE FILE
   NLSNEB      - NLSNEB - INCLUDE FILE
   NHSNEB      - NHSNEB - INCLUDE FILE
   TIMEVB      - TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
   CHKSTS      - CHKSTS.INC -- CHECK STATUS
   COMFLG      - COMFLG - INCLUDE FILE
   NTMINB      - NTMINB - INCLUDE FILE
   NTMOUB      - NTMOUB - INCLUDE FILE
   XMTBLK      - XMTBLK - INCLUDE FILE
   RCVBLK      - RCVBLK - INCLUDE FILE
   ERRPRO      - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:
----------------
   INTVH       - INITIALIZE COMM VARIABLES
   DACSES      - REPORT A SESSION FAILURE TO NTM
   ALINPS      - WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
   LBRESP      - PROCESS RESPONSE TO LINE BID
   IDLINE      - PROCESS INPUT OR TIMER RUNOUT
   ACTSES      - ACTIVATE SESSION IF REQUESTED TO BY NTM
   DELMBX
   RELEVB
   TRMLAN      - RELEASE THE PORT TO THE LAN
   TRMNAX
   ERRPRO
```

COMM Module Documentation

NAME: COMVI
PURPOSE: MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
LANGUAGE: VAX-11 COBOL
MODULE TYPE: PROGRAM
SOURCE FILE: COMVI
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- COMM IS ALWAYS IN ONE OF FOUR STATES.
1. SESSION INACTIVE - COMM IS EXECUTING BUT IT HAS NOT ESTABLISHED COMMUNICATIONS WITH THE NTM YET.
2. SESSION ACTIVE, LINE IDLE - COMM AND NTM HAVE ESTABLISHED COMMUNICATIONS BUT NTM HAS NO MESSAGES TO SEND AND COMM IS NOT RECEIVING ANY MESSAGES FROM THE COMM ON THE OTHER COMPUTER.
3. SESSION ACTIVE, LINE BID - NTM HAS REQUESTED THAT A MESSAGE BE SENT ACROSS THE LOCAL AREA NETWORK TO THE OTHER COMPUTER AND COMM IS REQUESTING PERMISSION FROM THE COMM ON THE OTHER COMPUTER TO BECOME MASTER OF THE LAN LINE.
4. SESSION ACTIVE, LINE ACTIVE - COMM IS RECEIVING A MESSAGE FROM THE COMM ON THE OTHER COMPUTER AND MUST SEND IT TO THE NTM AFTER REASSEMBLY, IF REQUIRED, IS DONE; OR, COMM IS SENDING A MESSAGE TO THE COMM ON THE OTHER COMPUTER FOR NTM.

THE MAIN MODULE LOOPS FOREVER DETERMINING THE STATE OF COMM AND PERFORMING THE REQUIRED PROCESSING. FOREVER ENDS IF AN ERROR OCCURS OR IF NTM REQUESTS COMM TO TERMINATE, AT WHICH TIME COMM SHUTS ITSELF DOWN. IF COMM IS EXPERIENCING DIFFICULTIES GETTING SUCCESSFUL TRANSMISSION RESPONSES FROM THE COMM ON THE OTHER COMPUTER, IT WILL PLACE ITSELF IN THE SESSION INACTIVE STATE.

-

INCLUDE FILES:

COMCON - COMCON - INCLUDE FILE
LANEVB - LANEVB.INC -- LAN TERMINAL EVENT BLOCK DESCRIPTION

```
  NRCVEB      - NRCVEB - INCLUDE FILE
  NLSNEB      - NLSNEB - INCLUDE FILE
  NHSNEB      - NHSNEB - INCLUDE FILE
  TIMEVB      - TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
  CHKSTS      - CHKSTS.INC -- CHECK STATUS
  COMFLG      - COMFLG - INCLUDE FILE
  NTMINB      - NTMINB - INCLUDE FILE
  NTMOUB      - NTMOUB - INCLUDE FILE
  XMTBLK      - XMTBLK - INCLUDE FILE
  RCVBLK      - RCVBLK - INCLUDE FILE
  ERRPRO      - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:
----------------
  INTVI       - INITIALIZE COMM VARIABLES
  DACSES      - REPORT A SESSION FAILURE TO NTM
  ALINPS      - WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
  LBRESP      - PROCESS RESPONSE TO LINE BID
  IDLINE      - PROCESS INPUT OR TIMER RUNOUT
  ACTSES      - ACTIVATE SESSION IF REQUESTED TO BY NTM
  DELMBX
  RELEVB
  TRMLAN      - RELEASE THE PORT TO THE LAN
  TRMNAX
  ERRPRO
```

COMM Module Documentation

NAME: DACSES
PURPOSE: REPORT A SESSION FAILURE TO NTM
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: DACSES
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- DACSES SETS THE FLAGS TO INDICATE THAT COMM IS INACTIVE AND HAS COMPLETED A SHUT DOWN. IT ALSO SENDS A CONTROL MESSAGE TO NTM.

ANY BAD STATUS CONDITIONS IN THIS ROUTINE ARE FATAL TO COMM.

-

ARGUMENTS:

NTM-SEND-EVENT-BLOCK-H = DSPLY [X(2032)]
TARGET-MAILBOX-NAME-H = DSPLY [X(14)]
FLAGS = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

COMCON	- COMCON - INCLUDE FILE
ERRSTS	- ERRSTS.INC -- IISS ERROR CODES
CHKSTS	- CHKSTS.INC -- CHECK STATUS
NHSNEB	- NHSNEB - INCLUDE FILE
COMFLG	- COMFLG - INCLUDE FILE
ERRPRO	- PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

SCTLMS	- REPORT RECOVERABLE ERROR OR STATUS MSG TO NTM
ERRPRO	

CALLED DIRECTLY BY:

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
IDLINE	- PROCESS INPUT OR TIMER RUNOUT

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: EXOUDA
PURPOSE: EXPAND NTM DATA IF CONTROL ARS OR BINARY
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: EXOUDA
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- EXOUDA MOVES THE MESSAGE RECEIVED FROM THE NTM TO THE DATA PORTION OF THE OUTPUT BUFFER IN PREPARATION FOR TRANSMISSION ACROSS THE LAN TO ANOTHER COMM. THE NTM HEADER IS MOVED EXACTLY AST IT IS. THE MESSAGE PORTION IS HANDLED DIFFERENTLY DEPENDING UPON ITS TYPE. IF THE MESSAGE TYPE IS NATIVE, EXOUDA SEARCHES THE MESSAGE FOR CONTROL CHARACTERS AND CONVERTS THEM TO TWO CHARACTERS, A CHARACTER THAT INDICATES TYPE OF CONTROL CHARACTER FOLLOWED BY A TRANSMITTABLE CHARACTER THAT IS USED AS A CODE TO INDICATE THE ORIGINAL CONTROL CHARACTER. IF THE MESSAGE TYPE IS BINARY, ALL THE CHARACTERS ARE TREATED AS IF THEY WERE NOT TRANSMITTABLE. EACH CHARACTER IS DIVIDED INTO TWO 4-BIT NIBBLES. THE CHARACTER EQUIVALENT OF THE VALUE OF EACH NIBBLE IS STORED IN THE OUTPUT BUFFER. EXOUDA SETS THE CONTROL BYTE IN THE HEADER OF THE COMM OUTPUT MESSAGE TO INDICATE THE TYPE OF DATA BEING SENT AND WHETHER THE BLOCK OF DATA IS COMPLETE.

-

ARGUMENTS:

NTM-OUTPUT-BLOCK = RECRD
XMIT-BLOCK = RECRD
FLAGS = RECRD

INCLUDE FILES:

COMCON	- COMCON - INCLUDE FILE
ERRSTS	- ERRSTS.INC -- IISS ERROR CODES
ASCII	- ASCII- INCLUDE FILE
NTMOUB	- NTMOUB - INCLUDE FILE
NTMHDR	- NTMHDR - INCLUDE FILE
XMTBLK	- XMTBLK - INCLUDE FILE

COMFLG - COMFLG - INCLUDE FILE
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

ERRPRO

CALLED DIRECTLY BY:

POUTMS - MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER

USED IN MAIN PROGRAM(S):

COMVH - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

```
NAME:                   GETLAN
PURPOSE:                GET A MESSAGE RECEIVED FROM A LAN
                        TERMINAL LINE
LANGUAGE:               VAX-11 COBOL
MODULE TYPE:            SUBROUTINE
SOURCE FILE:            GETLAN
SOURCE FILE TYPE:       .COB
HOST:                   VAX
SUBSYSTEM:              COMM
SUBDIRECTORY:
DOCUMENTATION GROUP:    COMM

DESCRIPTION:
------------
   GET THE MESSAGE RECEIVED FROM
  THE TERMINAL.  AN EVENT FLAG
  HAS INDICATED THE ARRIVAL OF THE MSG.



ARGUMENTS:
----------
  RCV-BLOCK = RECRD
  LAN-EVENT-BLOCK = RECRD
  RET-STATUS = DSPLY [X(5)]


INCLUDE FILES:
--------------
  CHKSTS      - CHKSTS.INC -- CHECK STATUS
  ERRSTS      - ERRSTS.INC -- IISS ERROR CODES
  RCVBLK      - RCVBLK - INCLUDE FILE
  LANEVB      - LANEVB.INC -- LAN TERMINAL EVENT BLOCK
                      DESCRIPTION
  ERRPRO      - PROCESS ERROR INCLUDE FILE


ROUTINES CALLED:
----------------
  FREVTF
  ERRPRO


CALLED DIRECTLY BY:
-------------------
  ALINPS      - WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
  IDLINE      - PROCESS INPUT OR TIMER RUNOUT
  LBRESP      - PROCESS RESPONSE TO LINE BID
  W1RESP      - WAIT FOR THE FIRST MESSAGE ON THE LAN


USED IN MAIN PROGRAM(S):
------------------------
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

COMVI - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: GOUTMS
PURPOSE: GET A MESSAGE FROM NTM
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: GOUTMS
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- GOUTMS DETERMINES IF THERE IS A MESSAGE FROM NTM IN THE MAILBOX. IF ONE IS PRESENT, IT IS MOVED INTO COMM STORAGE AND A NEW RECEIVE IS ISSUED FOR THE NTM MAILBOX.

EXCEPT FOR "MAILBOX EMPTY", ANY BAD STATUS CONDITION IN THIS ROUTINE IS FATAL TO COMM.

-

ARGUMENTS:

INPUT-MAILBOX-NAME = DSPLY [X(14)]
NTM-RCV-EVENT-BLOCK = DSPLY [X(2032)]
NTM-OUTPUT-BLOCK = RECRD
RET-STATUS = DSPLY [9(5)]

INCLUDE FILES:

COMCON	- COMCON - INCLUDE FILE
ERRSTS	- ERRSTS.INC -- IISS ERROR CODES
CHKSTS	- CHKSTS.INC -- CHECK STATUS
NRCVEB	- NRCVEB - INCLUDE FILE
NTMOUB	- NTMOUB - INCLUDE FILE
NTMHDR	- NTMHDR - INCLUDE FILE
ERRPRO	- PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

GETMSG
RCVMSG
ERRPRO

CALLED DIRECTLY BY:

ACTSES	- ACTIVATE SESSION IF REQUESTED TO BY NTM
IDLINE	- PROCESS INPUT OR TIMER RUNOUT

POUTMS - MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER

USED IN MAIN PROGRAM(S):

COMVH - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: IDLINE
PURPOSE: PROCESS INPUT OR TIMER RUNOUT
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: IDLINE
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- IDLINE FIRST CHECKS FOR A REQUEST FROM NTM TO TERMINATE THE SESSION. IF THE REQUEST HAS BEEN MADE, IDLINE CAUSES THE SESSION TO END. IF NTM HAS NOT MADE THE REQUEST, IDLINE WAITS FOR THE TIMER TO RUN OUT OR FOR A MESSAGE FROM EITHER NTM OR FROM COMM ON THE OTHER COMPUTER. IF A LINE BID IS RECEIVED FROM THE OTHER COMM, A POSITIVE ACKNOWLEDGEMENT IS RETURNED AND THE STATE OF COMM IS CHANGED TO SESSION ACTIVE, LINE ACTIVE. IF A MESSAGE IS RECEIVED FROM NTM, A LINE BID IS SENT TO THE COMM ON THE OTHER COMPUTER.

ANY BAD STATUS CONDITIONS IN THIS ROUTINE ARE FATAL TO COMM.

-

ARGUMENTS:

LAN-EVENT-BLOCK = RECRD
NTM-RCV-EVENT-BLOCK = DSPLY [X(2032)]
TIMER-EVENT-BLOCK = RECRD
NTM-SEND-EVENT-BLOCK-H = DSPLY [X(2032)]
XMIT-BLOCK = RECRD
RCV-BLOCK = RECRD
INPUT-MAILBOX-NAME = DSPLY [X(14)]
TARGET-MAILBOX-NAME-H = DSPLY [X(14)]
FLAGS = RECRD
NTM-OUTPUT-BLOCK = RECRD
NTM-INPUT-MSG-POSITION = DSPLY [9(4)]
NTM-INPUT-MSG = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

COMCON - COMCON - INCLUDE FILE
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
CHKSTS - CHKSTS.INC -- CHECK STATUS

```
  LANEVB      - LANEVB.INC -- LAN TERMINAL EVENT BLOCK
                      DESCRIPTION
  NRCVEB      - NRCVEB - INCLUDE FILE
  TIMEVB      - TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
  NHSNEB      - NHSNEB - INCLUDE FILE
  XMTBLK      - XMTBLK - INCLUDE FILE
  RCVBLK      - RCVBLK - INCLUDE FILE
  COMFLG      - COMFLG - INCLUDE FILE
  NTMOUB      - NTMOUB - INCLUDE FILE
  NTMHDR      - NTMHDR - INCLUDE FILE
  NTMINB      - NTMINB - INCLUDE FILE
  ERRPRO      - PROCESS ERROR INCLUDE FILE
```

ROUTINES CALLED:

```
  CNLLAN      - CANCEL A LAN TERMINAL LINE RECEIVE
  DACSES      - REPORT A SESSION FAILURE TO NTM
  WAIT03
  GETLAN      - GET A MESSAGE RECEIVED FROM A LAN TERMINAL LINE
  XMTMSG      - TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
  CNLTIM
  RCVLAN      - RECEIVE FROM A LAN TERMINAL LINE
  GOUTMS      - GET A MESSAGE FROM NTM
  LINBID      - TRANSMIT A LINE BID MESSAGE
  ERRPRO
```

CALLED DIRECTLY BY:

```
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

USED IN MAIN PROGRAM(S):

```
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

COMM Module Documentation

NAME: INILAN
PURPOSE: INITIALIZE THE LAN TERMINAL INTERFACE
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: INILAN
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

INITIALIZE THE TERMINAL INTERFACE TO THE LOCAL AREA NETWORK. PLACE THE CHANNEL NUMBER IN THE FIRST TWO BYTE OF THE RCV AND XMT BLOCKS.

ARGUMENTS:

PORT-NAME = RECRD
RCV-BLOCK = RECRD
XMIT-BLOCK = RECRD
LAN-EVENT-BLOCK = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

CHKSTS - CHKSTS.INC -- CHECK STATUS
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
RCVBLK - RCVBLK - INCLUDE FILE
XMTBLK - XMTBLK - INCLUDE FILE
LANEVB - LANEVB.INC -- LAN TERMINAL EVENT BLOCK DESCRIPTION

ROUTINES CALLED:

INITRM - INITIALIZE THE TERMINAL LINE **

CALLED DIRECTLY BY:

INTVH - INITIALIZE COMM VARIABLES
INTVI - INITIALIZE COMM VARIABLES

USED IN MAIN PROGRAM(S):

COMVH - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

```
NAME:                   INITRM
PURPOSE:                 INITIALIZE THE TERMINAL LINE
LANGUAGE:               VAX-11 FORTRAN
MODULE TYPE:            SUBROUTINE
SOURCE FILE:            INITRM
SOURCE FILE TYPE:       .FOR
HOST:                   VAX
SUBSYSTEM:              COMM
SUBDIRECTORY:
DOCUMENTATION GROUP:    COMM

DESCRIPTION:
------------
   TO ASSIGN A CHANNEL TO THE TERMINAL
  ON THE LAN


ARGUMENTS:
----------
  TARGET =  CHAR
          - TARGET COMPUTER FLAG
  PORTNM =  CHAR
          - TERMINAL PORT NAME
  CHANNL =  I*2
          - CHANNEL NUMBER
  RSTATS =  CHAR
          - RETURN STATUS


INCLUDE FILES:
--------------
  ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****


ROUTINES CALLED:
----------------
  ERRPRO
  PARITY      -  SET CHANNEL TO EVEN PARITY                    **
  PURGE       -  CLEAR THE TYPE AHEAD BUFFER                   **
  SETCHR      -  SET TERMINAL CHARACTERISTICS                  **
  SETSPD      -  INITIALIZE THE TERMINAL SPEED                 **
  SYS$ALLOC
  SYS$ASSIGN


CALLED DIRECTLY BY:
-------------------
  INILAN      - INITIALIZE THE LAN TERMINAL INTERFACE


USED IN MAIN PROGRAM(S):
------------------------
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

COMM Module Documentation

NAME: INTVH
PURPOSE: INITIALIZE COMM VARIABLES
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: INTVH
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- INTVH INITIALIZES THE MAILBOX AND PORT INTERFACE VARIABLES AND COMM STORAGE.

-

ARGUMENTS:

NTM-RCV-EVENT-BLOCK = DSPLY [X(2032)]
LAN-EVENT-BLOCK = RECRD
XMIT-BLOCK = RECRD
RCV-BLOCK = RECRD
INPUT-MAILBOX-NAME = DSPLY [X(14)]
TARGET-MAILBOX-NAME-H = DSPLY [X(14)]
TARGET-MAILBOX-NAME-L = DSPLY [X(14)]
FLAGS = RECRD
NTM-OUTPUT-BLOCK = RECRD
NTM-INPUT-MSG-POSITION = DSPLY [9(4)]
NTM-INPUT-MSG = RECRD
PORT-NAME = DSPLY [X(12)]
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

COMCON - COMCON - INCLUDE FILE
CHKSTS - CHKSTS.INC -- CHECK STATUS
NRCVEB - NRCVEB - INCLUDE FILE
XMTBLK - XMTBLK - INCLUDE FILE
RCVBLK - RCVBLK - INCLUDE FILE
COMFLG - COMFLG - INCLUDE FILE
NTMOUB - NTMOUB - INCLUDE FILE
NTMINB - NTMINB - INCLUDE FILE
LANEVB - LANEVB.INC -- LAN TERMINAL EVENT BLOCK DESCRIPTION
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

INICOM
RCVMSG

INILAN - INITIALIZE THE LAN TERMINAL INTERFACE
ERRPRO

CALLED DIRECTLY BY:

COMVH - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

USED IN MAIN PROGRAM(S):

COMVH - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: INTVI
PURPOSE: INITIALIZE COMM VARIABLES
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: INTVI
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- INTCM1 INITIALIZES THE MAILBOX AND PORT INTERFACE VARIABLES AND COMM STORAGE.

-

ARGUMENTS:

NTM-RCV-EVENT-BLOCK = DSPLY [X(2032)]
LAN-EVENT-BLOCK = RECRD
XMIT-BLOCK = RECRD
RCV-BLOCK = RECRD
INPUT-MAILBOX-NAME = DSPLY [X(14)]
TARGET-MAILBOX-NAME-H = DSPLY [X(14)]
TARGET-MAILBOX-NAME-L = DSPLY [X(14)]
FLAGS = RECRD
NTM-OUTPUT-BLOCK = RECRD
NTM-INPUT-MSG-POSITION = DSPLY [9(4)]
NTM-INPUT-MSG = RECRD
PORT-NAME = DSPLY [X(12)]
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

COMCON - COMCON - INCLUDE FILE
CHKSTS - CHKSTS.INC -- CHECK STATUS
NRCVEB - NRCVEB - INCLUDE FILE
XMTBLK - XMTBLK - INCLUDE FILE
RCVBLK - RCVBLK - INCLUDE FILE
COMFLG - COMFLG - INCLUDE FILE
NTMOUB - NTMOUB - INCLUDE FILE
NTMINB - NTMINB - INCLUDE FILE
LANEVB - LANEVB.INC -- LAN TERMINAL EVENT BLOCK DESCRIPTION
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

INICOM
RCVMSG

INILAN - INITIALIZE THE LAN TERMINAL INTERFACE
ERRPRO

CALLED DIRECTLY BY:

COMVI - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

USED IN MAIN PROGRAM(S):

COMVI - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: KLCLRC
PURPOSE: CALCULATE LONGITUDINAL REDUNDANCY CHECK
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: KLCLRC
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- KLCLRC CALCULATES THE LONGITUDINAL REDUNDANCY CHECK BY ADDING ALL THE CHARACTERS IN THE MESSAGE AND THEN SEPARATING THAT SUM INTO THREE 6-BYTE QUANTITIES. THESE THREE QUANTITIES BECOME INDEXES INTO A TABLE THAT CONTAINS CHARACTERS THAT WILL PASS THROUGH THE HARDWARE UNALTERED. THE THREE CHARACTERS ARE RETURNED TO THE CALLING ROUTINE.

-

ARGUMENTS:

LRC-BLOCK = RECRD
LRC-CHARS-ARRAY = RECRD
FLAGS = RECRD

INCLUDE FILES:

ASCII - ASCII- INCLUDE FILE
COMFLG - COMFLG - INCLUDE FILE

CALLED DIRECTLY BY:

KILXMT - PUT FINISHING TOUCHES ON MESSAGE TO LAN
PINPMS - PROCESS MESSAGE FROM OTHER COMM

USED IN MAIN PROGRAM(S):

COMVH - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: KMINDA
PURPOSE: COMPRESS THE DATA IN THE RECEIVE BUFFER
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: KMINDA
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- KMINDA FIRST MOVES THE NTM HEADER PORTION OF THE MESSAGE TO THE INPUT BUFFER. IT THEN DETERMINES WHETHER THE DATA PART OF THE MESSAGE FROM THE COMM ON THE OTHER COMPUTER IS NATIVE OR BINARY. IF THE DATA IS NATIVE, KMINDA SEARCHES IT FOR THE EXCLAMATION (!) CHARACTER. THE ! IS DISCARDED AND THE FOLLOWING CHARACTER IS CONVERTED TO A CONTROL CHARACTER THAT IS INSERTED INTO THE MESSAGE FOR THE NTM. IF THE DATA IS BINARY, KMINDA CONVERTS TWO CONSECUTIVE CHARACTERS BACK TO THEIR EQUIVALENT BINARY VALUES AND COMBINES THEM INTO ONE BYTE THAT IS PUT INTO THE MESSAGE FOR NTM.

-

ARGUMENTS:

RCV-BLOCK = RECRD
NTM-INPUT-MSG = RECRD
NTM-INPUT-MSG-POSITION = DSPLY [9(4)]
FLAGS = RECRD

INCLUDE FILES:

COMCON - COMCON - INCLUDE FILE
CTLASC - CTLASC - INCLUDE FILE
RCVBLK - RCVBLK - INCLUDE FILE
COMFLG - COMFLG - INCLUDE FILE
NTMINB - NTMINB - INCLUDE FILE

CALLED DIRECTLY BY:

PINPMS - PROCESS MESSAGE FROM OTHER COMM

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

```
NAME:                   KPLXMT
PURPOSE:                PUT FINISHING TOUCHES ON MESSAGE TO LAN
LANGUAGE:               VAX-11 COBOL
MODULE TYPE:            SUBROUTINE
SOURCE FILE:            KPLXMT
SOURCE FILE TYPE:       .COB
HOST:
SUBSYSTEM:              COMM
SUBDIRECTORY:
DOCUMENTATION GROUP:    COMM

DESCRIPTION:
------------
  - KPLXMT DETERMINES IF THE MESSAGE CONTAINS
  DATA, IN WHICH CASE, THE LONGITUDINAL
  REDUNDANCY CHECK (LRC) IS APPENDED TO THE
  END OF THE DATA; OR IF THE MESSAGE IS ONLY
  TO INDICATE AN END OF TRANSMISSION (EOT).
  (EOT INDICATES THAT THERE IS NO MORE DATA TO
  BE SENT AND THAT THE COMM ON THIS SIDE IS
  NO LONGER MASTER OF THE LAN LINE.)  KPLMIT
  ADDS THE MESSAGE TERMINATOR CHARACTER
  (A CARRIAGE RETURN) AND CAUSES THE MESSAGE TO
  BE SEND TO THE LAN.

  IF THE MESSAGE IS EOT, KPLXMT ALSO CANCELS THE
  TIMER.

  ANY BAD STATUS CONDITIONS IN THIS ROUTINE
  ARE FATAL TO COMM.

   -


ARGUMENTS:
----------
  XMIT-BLOCK = RECRD
  TIMER-EVENT-BLOCK = RECRD
  FLAGS = RECRD
  RCV-BLOCK = RECRD
  LAN-EVENT-BLOCK = RECRD
  RET-STATUS = DSPLY [X(5)]


INCLUDE FILES:
--------------
  COMCON      - COMCON - INCLUDE FILE
  CHKSTS      - CHKSTS.INC -- CHECK STATUS
  XMTBLK      - XMTBLK - INCLUDE FILE
  TIMEVB      - TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
  COMFLG      - COMFLG - INCLUDE FILE
  RCVBLK      - RCVBLK - INCLUDE FILE
  LANEVB      - LANEVB.INC -- LAN TERMINAL EVENT BLOCK
                      DESCRIPTION
  ERRPRO      - PROCESS ERROR INCLUDE FILE
```

ROUTINES CALLED:

KLCLRC	- CALCULATE LONGITUDINAL REDUNDANCY CHECK
XMTMSG	- TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
CNLTIM	
ERRPRO	

CALLED DIRECTLY BY:

ALRESP	- RESPOND TO MESSAGE FROM OTHER COMM

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: LBRESP
PURPOSE: PROCESS RESPONSE TO LINE BID
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: LBRESP
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- LBRESP WAITS FOR THE RESPONSE TO ITS LINE BID FROM THE COMM ON THE OTHER COMPUTER. IF THE RESPONSE IS INCORRECT OR IT IS NOT RECEIVED WITHIN THE GIVEN TIME INTERVAL, THE FACT IS REPORTED TO NTM AND THE LINE BID IS SEND AGAIN. IF THE RESPONSE RECEIVED IS CORRECT, LBRESP CHANGES THE STATE OF COMM TO SESSION ACTIVE, LINE ACTIVE AND CAUSES THE PROCESSING OF MESSAGES WITH DATA TO BEGIN.

ANY BAD STATUS CONDITIONS IN THIS ROUTINE ARE FATAL TO COMM.

-

ARGUMENTS:

LAN-EVENT-BLOCK = RECRD
NTM-RCV-EVENT-BLOCK = DSPLY [X(2032)]
TIMER-EVENT-BLOCK = RECRD
NTM-SEND-EVENT-BLOCK-H = DSPLY [X(2032)]
NTM-SEND-EVENT-BLOCK-L = DSPLY [X(2032)]
XMIT-BLOCK = RECRD
RCV-BLOCK = RECRD
INPUT-MAILBOX-NAME = DSPLY [X(14)]
TARGET-MAILBOX-NAME-H = DSPLY [X(14)]
TARGET-MAILBOX-NAME-L = DSPLY [X(14)]
FLAGS = RECRD
NTM-OUTPUT-BLOCK = RECRD
NTM-INPUT-MSG-POSITION = DSPLY [9(4)]
NTM-INPUT-MSG = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

COMCON - COMCON - INCLUDE FILE
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
CHKSTS - CHKSTS.INC -- CHECK STATUS
LANEVB - LANEVB.INC -- LAN TERMINAL EVENT BLOCK DESCRIPTION

```
  NRCVEB      - NRCVEB - INCLUDE FILE
  TIMEVB      - TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
  NHSNEB      - NHSNEB - INCLUDE FILE
  NLSNEB      - NLSNEB - INCLUDE FILE
  XMTBLK      - XMTBLK - INCLUDE FILE
  RCVBLK      - RCVBLK - INCLUDE FILE
  COMFLG      - COMFLG - INCLUDE FILE
  NTMOUB      - NTMOUB - INCLUDE FILE
  NTMINB      - NTMINB - INCLUDE FILE
  RPTERR      - **** PURPOSE NOT FOUND BY STRIPPER ****
  ERRPRO      - PROCESS ERROR INCLUDE FILE


ROUTINES CALLED:
----------------
  WAIT02
  CNLTIM
  GETLAN      - GET A MESSAGE RECEIVED FROM A LAN TERMINAL LINE
  ALRESP      - RESPOND TO MESSAGE FROM OTHER COMM
  RCVLAN      - RECEIVE FROM A LAN TERMINAL LINE
  CNLLAN      - CANCEL A LAN TERMINAL LINE RECEIVE
  LINBID      - TRANSMIT A LINE BID MESSAGE
  REPTER      - REPORT RECOVERABLE ERROR TO NTM
  ERRPRO


CALLED DIRECTLY BY:
-------------------
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM


USED IN MAIN PROGRAM(S):
------------------------
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

COMM Module Documentation

```
NAME:                   LINBID
PURPOSE:                TRANSMIT A LINE BID MESSAGE
LANGUAGE:               VAX-11 COBOL
MODULE TYPE:            SUBROUTINE
SOURCE FILE:            LINBID
SOURCE FILE TYPE:       .COB
HOST:
SUBSYSTEM:              COMM
SUBDIRECTORY:
DOCUMENTATION GROUP:    COMM

DESCRIPTION:
------------
  - LINBID REQUESTS THAT A MESSAGE BE TRANSMITTED
  TO THE COMM ON THE OTHER SIDE.  THE MESSAGE
  CONTAINS A CODE INDICATING THAT THIS COMM WANTS
  TO BE MASTER OF THE LINE BECAUSE IT HAS ONE OR
  MORE BLOCKS OF DATA TO TRANSMIT.

   -


ARGUMENTS:
----------
  FLAGS = RECRD
  XMIT-BLOCK = RECRD
  RCV-BLOCK = RECRD
  LAN-EVENT-BLOCK = RECRD
  TIMER-EVENT-BLOCK = RECRD
  RET-STATUS = DSPLY [X(5)]


INCLUDE FILES:
--------------
  COMCON      - COMCON - INCLUDE FILE
  CHKSTS      - CHKSTS.INC -- CHECK STATUS
  COMFLG      - COMFLG - INCLUDE FILE
  XMTBLK      - XMTBLK - INCLUDE FILE
  RCVBLK      - RCVBLK - INCLUDE FILE
  LANEVB      - LANEVB.INC -- LAN TERMINAL EVENT BLOCK
                      DESCRIPTION
  TIMEVB      - TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
  ERRPRO      - PROCESS ERROR INCLUDE FILE


ROUTINES CALLED:
----------------
  XMTMSG      - TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
  ERRPRO


CALLED DIRECTLY BY:
-------------------
  IDLINE      - PROCESS INPUT OR TIMER RUNOUT
  LBRESP      - PROCESS RESPONSE TO LINE BID
```

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

```
NAME:                   PARITY
PURPOSE:                 SET CHANNEL TO EVEN PARITY
LANGUAGE:               VAX-11 FORTRAN
MODULE TYPE:            SUBROUTINE
SOURCE FILE:            PARITY
SOURCE FILE TYPE:       .FOR
HOST:                   VAX
SUBSYSTEM:              COMM
SUBDIRECTORY:
DOCUMENTATION GROUP:    COMM

DESCRIPTION:
------------
   TO SET A CHANNEL TO EVEN PARITY


ARGUMENTS:
----------
  CHANNL =  I*2
          - CHANNEL NUMBER
  RSTATS =  CHAR
          - RETURN STATUS


INCLUDE FILES:
--------------
  ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****


ROUTINES CALLED:
----------------
  ERRPRO
  SYS$QIOW


CALLED DIRECTLY BY:
-------------------
  INITRM      -  INITIALIZE THE TERMINAL LINE                **


USED IN MAIN PROGRAM(S):
------------------------
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

COMM Module Documentation

NAME: PINPMS
PURPOSE: PROCESS MESSAGE FROM OTHER COMM
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: PINPMS
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- PINPMS CHECKS THE MESSAGE FOR TRANSMISSION ERRORS, VALIDATES THAT THE DATA BLOCK IS THE ONE EXPECTED, AND SENDS THE DATA TO THE NTM MAILBOX. IT ALSO FILLS IN THE RECEIVED SEQUENCE NUMBER IN THE COMM HEADER FOR THE NEXT MESSAGE TO BE TRANSMITTED.

-

ARGUMENTS:

RCV-BLOCK = RECRD
NTM-SEND-EVENT-BLOCK-H = DSPLY [X(2032)]
NTM-SEND-EVENT-BLOCK-L = DSPLY [X(2032)]
TARGET-MAILBOX-NAME-H = DSPLY [X(14)]
TARGET-MAILBOX-NAME-L = DSPLY [X(14)]
FLAGS = RECRD
XMIT-BLOCK = RECRD
NTM-INPUT-MSG-POSITION = DSPLY [9(4)]
NTM-INPUT-MSG = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

COMCON - COMCON - INCLUDE FILE
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
CHKSTS - CHKSTS.INC -- CHECK STATUS
TIMEVB - TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
RCVBLK - RCVBLK - INCLUDE FILE
NHSNEB - NHSNEB - INCLUDE FILE
NLSNEB - NLSNEB - INCLUDE FILE
COMFLG - COMFLG - INCLUDE FILE
XMTBLK - XMTBLK - INCLUDE FILE
NTMINB - NTMINB - INCLUDE FILE
NTMHDR - NTMHDR - INCLUDE FILE
RPTERR - **** PURPOSE NOT FOUND BY STRIPPER ****
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

KLCLRC	- CALCULATE LONGITUDINAL REDUNDANCY CHECK
TRCVH1	- TEST 1ST BYTE IN HEADER OF RECEIVED MSG
KMINDA	- COMPRESS THE DATA IN THE RECEIVE BUFFER
SETTIM	
WAIT01	
UDRSQN	- UPDATE RECEIVE SEQUENCE NUMBER
SNDMSG	
REPTER	- REPORT RECOVERABLE ERROR TO NTM
ERRPRO	

CALLED DIRECTLY BY:

ALRESP	- RESPOND TO MESSAGE FROM OTHER COMM

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: POUTMS
PURPOSE: MOVE DATA FROM NTM MAILBOX TO LAN OUTPUT BUFFER
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: POUTMS
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- POUTMS FIRST DETERMINES IF THERE IS ANY DATA REMAINING FROM THE LAST MESSAGE RECEIVED FROM NTM TO BE SENT TO COMM ON THE OTHER COMPUTER. IF THERE IS, POUTMS CAUSES IT TO BE CHECKED FOR BINARY OR CONTROL CHARACTERS AND MOVED TO THE BUFFER FOR OUTPUT. IF NO DATA IS LEFT, POUTMS TRIES TO GET THE NEXT MESSAGE FROM NTM. IF THERE IS NO MESSAGE, POUTMS RETURNS TO THE CALLING ROUTINE. IF THERE IS DATA, IT IS CHECKED FOR BINARY OR CONTROL CHARACTERS AND MOVED TO THE BUFFER FOR OUTPUT TO COMM ON ON THE OTHER COMPUTER. IF THE MESSAGE FROM NTM IS A CONTROL MESSAGE TO DEACTIVATE THE SESSION, POUTMS SETS THE FLAG TO INDICATE THAT. ANY OTHER TYPE OF MESSAGE FROM NTM AT THIS TIME IS ILLEGAL.

-

ARGUMENTS:

NTM-RCV-EVENT-BLOCK = DSPLY [X(2032)]
INPUT-MAILBOX-NAME = DSPLY [X(14)]
FLAGS = RECRD
NTM-OUTPUT-BLOCK = RECRD
XMIT-BLOCK = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

COMCON - COMCON - INCLUDE FILE
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
CHKSTS - CHKSTS.INC -- CHECK STATUS
NRCVEB - NRCVEB - INCLUDE FILE
COMFLG - COMFLG - INCLUDE FILE
NTMOUB - NTMOUB - INCLUDE FILE
NTMHDR - NTMHDR - INCLUDE FILE
XMTBLK - XMTBLK - INCLUDE FILE
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

EXOUDA	- EXPAND NTM DATA IF CONTROL CHARS OR BINARY
GOUTMS	- GET A MESSAGE FROM NTM
ERRPRO	

CALLED DIRECTLY BY:

ALRESP	- RESPOND TO MESSAGE FROM OTHER COMM

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

```
NAME:                   PURGE
PURPOSE:                 CLEAR THE TYPE AHEAD BUFFER
LANGUAGE:               VAX-11 FORTRAN
MODULE TYPE:            SUBROUTINE
SOURCE FILE:            PURGE
SOURCE FILE TYPE:       .FOR
HOST:                   VAX
SUBSYSTEM:              COMM
SUBDIRECTORY:
DOCUMENTATION GROUP:    COMM

DESCRIPTION:
------------
   REMOVE ALL CHARACTERS FROM THE TYPE AHEAD BUFFER


ARGUMENTS:
----------
  CHANNL =   I*2
           - CHANNEL NUMBER
  RSTATS =   CHAR
           - RETURN STATUS


INCLUDE FILES:
--------------
  ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****


ROUTINES CALLED:
----------------
  ERRPRO
  SYS$QIOW


CALLED DIRECTLY BY:
-------------------
  INITRM      -  INITIALIZE THE TERMINAL LINE                **


USED IN MAIN PROGRAM(S):
------------------------
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

COMM Module Documentation

```
NAME:                   RCV5H
PURPOSE:                 RECEIVE 5 CURSORS FROM THE IBM
LANGUAGE:               VAX-11 FORTRAN
MODULE TYPE:            SUBROUTINE
SOURCE FILE:            RCV5H
SOURCE FILE TYPE:       .FOR
HOST:                   VAX
SUBSYSTEM:              COMM
SUBDIRECTORY:
DOCUMENTATION GROUP:    COMM

DESCRIPTION:
------------
   TO READ AND DISCARD EXTRANEOUS CHARACTERS
  FROM PROTOCOL CONVERTERS.


ARGUMENTS:
----------
  CHANNL =  I*2
          - TERMINAL CHANNEL NUMBER
  RSTATS =  CHAR
          - RETURN STATUS


INCLUDE FILES:
--------------
  ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****


ROUTINES CALLED:
----------------
  ERRPRO
  SYS$QIO


CALLED DIRECTLY BY:
-------------------
  XMTLAN      - TRANSMIT TO A LAN TERMINAL LINE


USED IN MAIN PROGRAM(S):
------------------------
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

COMM Module Documentation

```
NAME:                   RCVIBM
PURPOSE:                 READ TERMINAL LINE FROM PROTOCOL
                        CONVERTER
LANGUAGE:               VAX-11 FORTRAN
MODULE TYPE:            SUBROUTINE
SOURCE FILE:            RCVIBM
SOURCE FILE TYPE:       .FOR
HOST:                   VAX
SUBSYSTEM:              COMM
SUBDIRECTORY:
DOCUMENTATION GROUP:    COMM

DESCRIPTION:
------------
   TO ISSUE A RECEIVE TO A TERMINAL ON THE LAN


ARGUMENTS:
----------
  CHANNL =  I*2
          - TERMINAL CHANNEL NUMBER
  EVTFLG =  I*2
          - EVENT FLAG
  EVTBLK =  I*2  (*)
          - EVENT BLOCK
  RCVBLK =  L*1  (*)
          - RECEIVE BLOCK
  LENGTH =  I*2
          - RECEIVE BUFFER LENGTH
  RSTATS =  CHAR
          - RETURN STATUS


INCLUDE FILES:
--------------
  ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****


ROUTINES CALLED:
----------------
  ERRPRO
  LIB$GET_EF
  SYS$QIO
  SYS$SETPRI


CALLED DIRECTLY BY:
-------------------
  RCVLAN      - RECEIVE FROM A LAN TERMINAL LINE


USED IN MAIN PROGRAM(S):
------------------------
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

COMM Module Documentation

```
NAME:                   RCVLAN
PURPOSE:                RECEIVE FROM A LAN TERMINAL LINE
LANGUAGE:               VAX-11 COBOL
MODULE TYPE:            SUBROUTINE
SOURCE FILE:            RCVLAN
SOURCE FILE TYPE:       .COB
HOST:                   VAX
SUBSYSTEM:              COMM
SUBDIRECTORY:
DOCUMENTATION GROUP:    COMM

DESCRIPTION:
------------
   RECEIVE FROM A TERMINAL LINE AND
  CONTINUE PROCESSING.  USE AN
  EVENT FLAG TO ISSUE THE READ.



ARGUMENTS:
----------
  RCV-BLOCK = RECRD
  EVENT-NUMBER = DSPLY [99]
  LAN-EVENT-BLOCK = RECRD
  FLAGS = RECRD
  RET-STATUS = DSPLY [X(5)]


INCLUDE FILES:
--------------
  CHKSTS      - CHKSTS.INC -- CHECK STATUS
  ERRSTS      - ERRSTS.INC -- IISS ERROR CODES
  RCVBLK      - RCVBLK - INCLUDE FILE
  LANEVB      - LANEVB.INC -- LAN TERMINAL EVENT BLOCK
                      DESCRIPTION
  COMFLG      - COMFLG - INCLUDE FILE
  ERRPRO      - PROCESS ERROR INCLUDE FILE


ROUTINES CALLED:
----------------
  RCVIBM      -  READ TERMINAL LINE FROM PROTOCOL CONVERTER **
  RCVTRM      -  READ TERMINAL LINE WITH EVENT FLAG         **
  ERRPRO


CALLED DIRECTLY BY:
-------------------
  ALINPS      - WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
  ALRESP      - RESPOND TO MESSAGE FROM OTHER COMM
  IDLINE      - PROCESS INPUT OR TIMER RUNOUT
  LBRESP      - PROCESS RESPONSE TO LINE BID
  W1RESP      - WAIT FOR THE FIRST MESSAGE ON THE LAN
  XMTMSG      - TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
```

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: RCVTRM
PURPOSE: READ TERMINAL LINE WITH EVENT FLAG
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: RCVTRM
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

TO ISSUE A RECEIVE TO A TERMINAL ON THE LAN

ARGUMENTS:

CHANNL = I*2
- TERMINAL CHANNEL NUMBER

EVTFLG = I*2
- EVENT FLAG

EVTBLK = I*2 (*)
- EVENT BLOCK

RCVBLK = L*1 (*)
- RECEIVE BLOCK

LENGTH = I*2
- RECEIVE BUFFER LENGTH

RSTATS = CHAR
- RETURN STATUS

INCLUDE FILES:

ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

ERRPRO
LIB$GET_EF
SYS$QIO
SYS$SETPRI

CALLED DIRECTLY BY:

RCVLAN - RECEIVE FROM A LAN TERMINAL LINE

USED IN MAIN PROGRAM(S):

COMVH - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: REPTER
PURPOSE: REPORT RECOVERABLE ERROR TO NTM
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: REPTER
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- REPTER SENDS A RECOVERABLE ERROR CODE TO NTM TO BE RECORDED WITH THE SYSTEM STATISTICS INFORMATION. THE CODES ARE CONCERNED WITH THE INABILITY OF COMM TO TRANSMIT OR RECEIVE MESSAGES ON THE LOCAL AREA NETWORK PORT. REPTER ALSO INCREMENTS THE RETRY COUNT.

-

ARGUMENTS:

COMM-STATUS = DSPLY [X(5)]
FLAGS = RECRD
NTM-SEND-EVENT-BLOCK-H = DSPLY [X(2032)]
TARGET-MAILBOX-NAME-H = DSPLY [X(7)]
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

ERRSTS	- ERRSTS.INC -- IISS ERROR CODES
COMCON	- COMCON - INCLUDE FILE
CHKSTS	- CHKSTS.INC -- CHECK STATUS
NHSNEB	- NHSNEB - INCLUDE FILE
COMFLG	- COMFLG - INCLUDE FILE
ERRPRO	- PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

SCTLMS	- REPORT RECOVERABLE ERROR OR STATUS MSG TO NTM
ERRPRO	

CALLED DIRECTLY BY:

ACTSES	- ACTIVATE SESSION IF REQUESTED TO BY NTM
ALINPS	- WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
ALRESP	- RESPOND TO MESSAGE FROM OTHER COMM
LBRESP	- PROCESS RESPONSE TO LINE BID

PINPMS - PROCESS MESSAGE FROM OTHER COMM

USED IN MAIN PROGRAM(S):

COMVH - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: SCTLMS
PURPOSE: REPORT RECOVERABLE ERROR OR STATUS MSG TO NTM
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: SCTLMS
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- SCTLMS SENDS A RECOVERABLE ERROR CODE OR A STATUS MESSAGE TO NTM. NTM RECORDS THE INFORMATION WITH THE SYSTEM STATISTICS.

-

ARGUMENTS:

NTM-SEND-EVENT-BLOCK-H = DSPLY [X(2032)]
TARGET-MAILBOX-NAME-H = DSPLY [X(14)]
CONTROL-MSG-TYPE = DSPLY [X(2)]
MSG-DATA = DSPLY [X(5)]
FLAGS = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

CANHDR - CHKSTS.INC -- CHECK STATUS
CHKSTS - CHKSTS.INC -- CHECK STATUS
NHSNEB - NHSNEB - INCLUDE FILE
COMFLG - COMFLG - INCLUDE FILE
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

INSTNC
SNDMSG
ERRPRO

CALLED DIRECTLY BY:

DACSES - REPORT A SESSION FAILURE TO NTM
REPTER - REPORT RECOVERABLE ERROR TO NTM
W1RESP - WAIT FOR THE FIRST MESSAGE ON THE LAN

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: SETCHR
PURPOSE: SET TERMINAL CHARACTERISTICS
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: SETCHR
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

TO SET THE CHARACTERISTICS OF A VAX TERMINAL LINE

ARGUMENTS:

CHANNL = I*2
- CHANNEL NUMBER

CHR = I*4
- CHARACTERISTIC TO BE SET

STATE = I*4
- STATE (1 = ON, 0 = OFF)

RSTATS = CHAR
- RETURN STATUS

INCLUDE FILES:

ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

SYS$QIOW

CALLED DIRECTLY BY:

INITRM - INITIALIZE THE TERMINAL LINE **

USED IN MAIN PROGRAM(S):

COMVH - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: SETSPD
PURPOSE: INITIALIZE THE TERMINAL SPEED
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: SETSPD
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

TO ASSIGN A SPEED TO THE TERMINAL CHANNEL

ARGUMENTS:

CHANNL = I*2
- CHANNEL NUMBER
SPEED = I*4
- CHANNEL SPEED
RSTATS = CHAR
- RETURN STATUS

INCLUDE FILES:

ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

ERRPRO
SYS$QIOW

CALLED DIRECTLY BY:

INITRM - INITIALIZE THE TERMINAL LINE **

USED IN MAIN PROGRAM(S):

COMVH - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: STRTIM
PURPOSE: SET APPROPRIATE TIME INTERVAL AND START TIMER
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: STRTIM
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- STRTIM DETERMINES THE TIME INTERVAL BASED ON THE STATE OF COMM. IT THEN INVOKES THE TIMER FOR THAT TIME INTERVAL AND RETURNS TO THE CALLING ROUTINE.

ANY BAD STATUS IN THIS ROUTINE IS FATAL TO COMM.

-

ARGUMENTS:

TIMER-EVENT-BLOCK = RECRD
FLAGS = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

COMCON	- COMCON - INCLUDE FILE
CHKSTS	- CHKSTS.INC -- CHECK STATUS
COMFLG	- COMFLG - INCLUDE FILE
TIMEVB	- TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
ERRPRO	- PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

SETTIM
ERRPRO

CALLED DIRECTLY BY:

XMTMSG	- TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: TRCVH1
PURPOSE: TEST 1ST BYTE IN HEADER OF RECEIVED MSG
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: TRCVH1
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- TRCVH1 CHECKS THAT THE FIRST BYTE IN THE HEADER OF THE MESSAGE RECEIVED FROM COMM ON OTHER COMPUTER IS EITHER ZERO OR A SEQUENCE NUMBER INDICATING THE MESSAGE WAS THE FIRST OR THE NEXT ONE IN THE SERIES. IN OTHER WORDS, CRCVH1 CHECKS THAT THE FIRST BYTE CONTAINS THE EXPECTED SEQUENCE NUMBER FOR THE RECEIVED MESSAGE.

-

ARGUMENTS:

RCV-BLOCK = RECRD
RET-STATUS = DSPLY [9(5)]

INCLUDE FILES:

ERRSTS	- ERRSTS.INC -- IISS ERROR CODES
COMCON	- COMCON - INCLUDE FILE
RCVBLK	- RCVBLK - INCLUDE FILE

CALLED DIRECTLY BY:

PINPMS	- PROCESS MESSAGE FROM OTHER COMM

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: TRCVH2
PURPOSE: TEST 2ND BYTE IN HEADER OF RECEIVED MSG
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: TRCVH2
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- TRCVH2 VALIDATES THAT THE SECOND BYTE IN THE HEADER OF THE MESSAGE RECEIVED FROM COMM ON THE OTHER COMPUTER IS EITHER ZERO OR THE EXPECTED SEQUENCE NUMBER. THE SEQUENCE NUMBER INDICATES IF THE LAST MESSAGE TRANSMITTED FROM THIS SIDE WAS RECEIVED CORRECTLY BY THE OTHER SIDE.

-

ARGUMENTS:

RCV-BLOCK = RECRD
XMIT-BLOCK = RECRD
RET-STATUS = DSPLY [9(5)]

INCLUDE FILES:

ERRSTS	- ERRSTS.INC -- IISS ERROR CODES
COMCON	- COMCON - INCLUDE FILE
RCVBLK	- RCVBLK - INCLUDE FILE
XMTBLK	- XMTBLK - INCLUDE FILE

CALLED DIRECTLY BY:

ALRESP	- RESPOND TO MESSAGE FROM OTHER COMM

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: TRMLAN
PURPOSE: RELEASE THE PORT TO THE LAN
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: TRMLAN
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- THE IBM NEEDS A SPECIAL ROUTINE TO REQUEST VTAM TO RELEASE THE PORT. THIS IS A DUMMY ROUTINE ON THE VAX AND LEVEL 6.

ARGUMENTS:

PORT-NAME = DSPLY [X(12)]
RCV_BLOCK =
XMIT-BLOCK = RECRD
LAN-EVENT-BLOCK = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

RCVBLK	- RCVBLK - INCLUDE FILE
XMTBLK	- XMTBLK - INCLUDE FILE
LANEVB	- LANEVB.INC -- LAN TERMINAL EVENT BLOCK DESCRIPTION

CALLED DIRECTLY BY:

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: UDRSQN
PURPOSE: UPDATE RECEIVE SEQUENCE NUMBER
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: UDRSQN
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- UDRSQN INCREMENTS THE RECEIVE SEQUENCE NUMBER. WHEN THE UPPER LIMIT IS REACHED, THE RECEIVE SEQUENCE NUMBER IS RESET TO THE LOWER LIMIT.

-

ARGUMENTS:

RCV-BLOCK = RECRD

INCLUDE FILES:

COMCON	- COMCON - INCLUDE FILE
RCVBLK	- RCVBLK - INCLUDE FILE

CALLED DIRECTLY BY:

PINPMS	- PROCESS MESSAGE FROM OTHER COMM

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: UDXSQN
PURPOSE: UPDATE TRANSMIT SEQUENCE NUMBER
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: UDXSQN
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- UDXSQN INCREMENTS THE TRANSMIT SEQUENCE NUMBER. WHEN THE UPPER LIMIT IS REACHED, THE TRANSMIT SEQUENCE NUMBER IS RESET TO THE LOWER LIMIT.

-

ARGUMENTS:

XMIT-BLOCK = RECRD

INCLUDE FILES:

COMCON	- COMCON - INCLUDE FILE
XMTBLK	- XMTBLK - INCLUDE FILE

CALLED DIRECTLY BY:

ALRESP	- RESPOND TO MESSAGE FROM OTHER COMM

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: W1RESP
PURPOSE: WAIT FOR THE FIRST MESSAGE ON THE LAN
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: W1RESP
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- W1RESP WAITS FOR EITHER A MESSAGE FROM THE COMM ON THE OTHER COMPUTER OR THE TIMER TO RUN OUT. IF THE TIMER RUNS OUT, NTM IS NOTIFIED THAT COMM COULD NOT START THE SESSION. COMM ALSO NOTIFIES NTM THAT IT FAILED TO START THE SESSION IF THE MESSAGE RECEIVED FROM THE OTHER COMM IS NOT THE ONE EXPECTED. THE ACCEPTABLE MESSAGES ARE LINE CHECK AND AND LINE BID RESPONSE. IF THE MESSAGE FROM THE OTHER COMM IS CORRECT, W1RESP PUTS THIS COMM IN THE SESSION ACTIVE, LINE IDLE STATE. IF THE MESSAGE IS LINE CHECK, W1RESP TRANSMITS A LINE BID RESPONSE MESSAGE.

ANY BAD STATUS CONDITIONS IN THIS ROUTINE ARE FATAL TO COMM.

-

ARGUMENTS:

LAN-EVENT-BLOCK = RECRD
TIMER-EVENT-BLOCK = RECRD
NTM-SEND-EVENT-BLOCK-H = DSPLY [X(2032)]
RCV-BLOCK = RECRD
XMIT-BLOCK = RECRD
TARGET-MAILBOX-NAME-H = DSPLY [X(14)]
FLAGS = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

COMCON - COMCON - INCLUDE FILE
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
CHKSTS - CHKSTS.INC -- CHECK STATUS
LANEVB - LANEVB.INC -- LAN TERMINAL EVENT BLOCK DESCRIPTION
TIMEVB - TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
NHSNEB - NHSNEB - INCLUDE FILE
RCVBLK - RCVBLK - INCLUDE FILE

```
  XMTBLK      - XMTBLK - INCLUDE FILE
  COMFLG      - COMFLG - INCLUDE FILE
  ERRPRO      - PROCESS ERROR INCLUDE FILE


ROUTINES CALLED:
----------------
  WAIT02
  CNLTIM
  GETLAN      - GET A MESSAGE RECEIVED FROM A LAN TERMINAL LINE
  RCVLAN      - RECEIVE FROM A LAN TERMINAL LINE
  XMTMSG      - TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
  CNLLAN      - CANCEL A LAN TERMINAL LINE RECEIVE
  SCTLMS      - REPORT RECOVERABLE ERROR OR STATUS MSG TO NTM
  ERRPRO


CALLED DIRECTLY BY:
-------------------
  ACTSES      - ACTIVATE SESSION IF REQUESTED TO BY NTM


USED IN MAIN PROGRAM(S):
------------------------
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

COMM Module Documentation

NAME: XMTLAN
PURPOSE: TRANSMIT TO A LAN TERMINAL LINE
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: XMTLAN
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

TRANSMIT TO A TERMINAL LINE AND CONTINUE PROCESSING. ASSUME THE DATA WAS TRANSMITTED OK.

ARGUMENTS:

XMIT-BLOCK = RECRD
LAN-EVENT-BLOCK = RECRD
FLAGS = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

CHKSTS	- CHKSTS.INC -- CHECK STATUS
ERRSTS	- ERRSTS.INC -- IISS ERROR CODES
XMTBLK	- XMTBLK - INCLUDE FILE
LANEVB	- LANEVB.INC -- LAN TERMINAL EVENT BLOCK DESCRIPTION
COMFLG	- COMFLG - INCLUDE FILE
ERRPRO	- PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

XMTTRM	- TRANSMIT TO THE TERMINAL LINE	**
RCV5H	- RECEIVE 5 CURSORS FROM THE IBM	**
ERRPRO		

CALLED DIRECTLY BY:

XMTMSG	- TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

NAME: XMTMSG
PURPOSE: TRANSMIT MESSAGE TO COMM ON OTHER COMPUTER
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: XMTMSG
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: COMM
SUBDIRECTORY:
DOCUMENTATION GROUP: COMM

DESCRIPTION:

- XMTMSG GIVES TO THE TRANSMIT PRIMITIVE THE COMPLETED MESSAGE TO BE SENT TO THE COMM ON THE OTHER COMPUTER. IT THEN ISSUES THE RECEIVE FOR THE RETURNING MESSAGE AND IT STARTS A TIMER IN CASE THE RETURNING MESSAGE FAILS TO ARRIVE IN A REASONABLE LENGTH OF TIME.

ANY BAD STATUS IN THIS ROUTINE IS FATAL TO COMM.

-

ARGUMENTS:

FLAGS = RECRD
XMIT-BLOCK = RECRD
RCV-BLOCK = RECRD
LAN-EVENT-BLOCK = RECRD
TIMER-EVENT-BLOCK = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

COMCON - COMCON - INCLUDE FILE
CHKSTS - CHKSTS.INC -- CHECK STATUS
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
COMFLG - COMFLG - INCLUDE FILE
XMTBLK - XMTBLK - INCLUDE FILE
RCVBLK - RCVBLK - INCLUDE FILE
LANEVB - LANEVB.INC -- LAN TERMINAL EVENT BLOCK DESCRIPTION
TIMEVB - TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

XMTLAN - TRANSMIT TO A LAN TERMINAL LINE
RCVLAN - RECEIVE FROM A LAN TERMINAL LINE

STRTIM	- SET APPROPRIATE TIME INTERVAL AND START TIMER
ERRPRO	

CALLED DIRECTLY BY:

ACTSES	- ACTIVATE SESSION IF REQUESTED TO BY NTM
ALINPS	- WAIT FOR INPUT FROM LAN OR TIMER RUNOUT
IDLINE	- PROCESS INPUT OR TIMER RUNOUT
KPLXMT	- PUT FINISHING TOUCHES ON MESSAGE TO LAN
LINBID	- TRANSMIT A LINE BID MESSAGE
W1RESP	- WAIT FOR THE FIRST MESSAGE ON THE LAN

USED IN MAIN PROGRAM(S):

COMVH	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
COMVI	- MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM

COMM Module Documentation

```
NAME:                   XMTTRM
PURPOSE:                 TRANSMIT TO THE TERMINAL LINE
LANGUAGE:               VAX-11 FORTRAN
MODULE TYPE:            SUBROUTINE
SOURCE FILE:            XMTTRM
SOURCE FILE TYPE:       .FOR
HOST:                   VAX
SUBSYSTEM:              COMM
SUBDIRECTORY:
DOCUMENTATION GROUP:    COMM

DESCRIPTION:
------------
   TO TRANSMIT TO A TERMINAL ON THE LAN


ARGUMENTS:
----------
  CHANNL =  I*2
          - TERMINAL CHANNEL NUMBER
  XMTBLK =  L*1  (*)
          - TRANSMIT BLOCK
  LENGTH =  I*2
          - BUFFER LENGTH
  RSTATS =  CHAR
          - RETURN STATUS


INCLUDE FILES:
--------------
  ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****


ROUTINES CALLED:
----------------
  ERRPRO
  SYS$QIOW
  SYS$SETPRI


CALLED DIRECTLY BY:
-------------------
  XMTLAN      - TRANSMIT TO A LAN TERMINAL LINE


USED IN MAIN PROGRAM(S):
------------------------
  COMVH       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
  COMVI       - MAIN MODULE FOR COMMUNICATIONS SUBSYSTEM
```

3.10.9 Include File Descriptions

The following list contains a purpose and description of each include file listed in 3.10.4 as specified in the source code. The language it is written in is also given.

COMM Include File Description

FILE NAME: ASCII
PURPOSE: ASCII- INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DESCRIPTION: - THIS IS THE TABLE USED TO IDENTIFY THE VALID SET OF ASCII CHARACTERS.

A NEGATIVE ENTRY INDICATES A CONTROL CHARACTER SUBSTITUTION (JUST NEGATE), A POSITIVE VALUE YIELDS THE VALID CHARACTER AND A ZERO ENTRY MEANS AN INVALID CHARACTER.

COMM Include File Description

FILE NAME: CANHDR
PURPOSE: CHKSTS.INC -- CHECK STATUS
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

COMM Include File Description

FILE NAME: CHKSTS
PURPOSE: CHKSTS.INC -- CHECK STATUS
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

COMM Include File Description

FILE NAME: COMCON
PURPOSE: COMCON - INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DESCRIPTION: - COMCON IS AN INCLUDE FILE THAT DESCRIBES
THE CONSTANTS USED IN THE COMM SUBSYSTEM.

EVENT NUMBERS

COMM Include File Description

FILE NAME: COMFLG
PURPOSE: COMFLG - INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DESCRIPTION: - COMFLG IS AN INCLUDE FILE THAT DESCRIBES
THE STORAGE FOR THE FLAGS BLOCK.

COMM Include File Description

FILE NAME: CTLASC
PURPOSE: CTLASC - INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DESCRIPTION: - THIS TABLE IS USED BY KMINDA TO SUBSTITUTE THE CORRECT CONTROL CHARACTER FOR THE CHARACTER FOUND IN THE MESSAGE.

THIS TABLE IS COMPILED WITH THE ASCII VERSIONS OF COMM (NOT FOR IBM).

COMM Include File Description

FILE NAME: ERRPRO
PURPOSE: PROCESS ERROR INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

COMM Include File Description

FILE NAME: ERRSTS
PURPOSE: ERRSTS.INC -- IISS ERROR CODES
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

THIS FILE CONTAINS ALL IISS ERROR CODES DEFINED IN *
COBOL FORMAT *

COMM Include File Description

FILE NAME: LANEVB
PURPOSE: LANEVB.INC -- LAN TERMINAL EVENT BLOCK DESCRIPTION
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

COMM Include File Description

FILE NAME: NHSNEB
PURPOSE: NHSNEB - INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DESCRIPTION: - DESCRIBES THE EVENT BLOCK USED TO SEND
MESSAGES TO THE HIGH PRIORITY NTM QUEUE.

COMM Include File Description

FILE NAME: NLSNEB
PURPOSE: NLSNEB - INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DESCRIPTION: - DESCRIBES THE EVENT BLOCK USED TO SEND
MESSAGES TO THE LOW PRIORITY NTM QUEUE.

COMM Include File Description

FILE NAME: NRCVEB
PURPOSE: NRCVEB - INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DESCRIPTION: - NRCVEB IS AN INCLUDE FILE THAT DESCRIBES
THE EVENT BLOCK USED TO RECEIVE
MESSAGES FROM THE NTM.

COMM Include File Description

FILE NAME: NTMHDR
PURPOSE: NTMHDR - INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DESCRIPTION: - THIS FILE DESCRIBES THE NTM MESSAGE FOR
THE PURPOSES OF THE COMM INTERFACE.
IT IS ALWAYS REFERENCED DIRECTLY AFTER
THE NTM OUTPUT BLOCK (NTMOUB.INC).

COMM Include File Description

FILE NAME: NTMINB
PURPOSE: NTMINB - INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DESCRIPTION: - NTMINB IS AN INCLUDE FILE THAT DESCRIBES
THE "TO NTM" VARIABLES.

COMM Include File Description

FILE NAME: NTMOUB
PURPOSE: NTMOUB - INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DESCRIPTION: - NTMOUB IS AN INCLUDE FILE THAT DESCRIBES
THE NTM-OUTPUT-BLOCK.

COMM Include File Description

FILE NAME: RCVBLK
PURPOSE: RCVBLK - INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DESCRIPTION: - RCVBLK IS AN INCLUDE FILE THAT DESCRIBES
THE CONTENTS OF THE RCV-BLOCK.

COMM Include File Description

FILE NAME: TIMEVB
PURPOSE: TIMEVB.INC -- TIME EVENT BLOCK DESCRIPTION
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

COMM Include File Description

FILE NAME: XMTBLK
PURPOSE: XMTBLK - INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

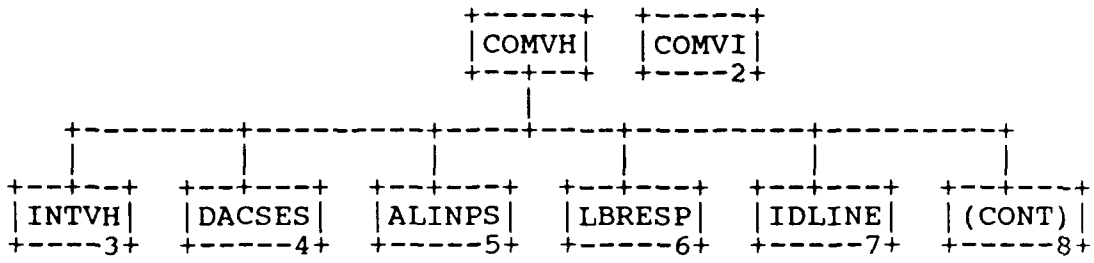
DESCRIPTION: - XMTBLK IS AN INCLUDE FILE THAT DESCRIBES
THE CONTENTS OF THE XMIT-BLOCK.

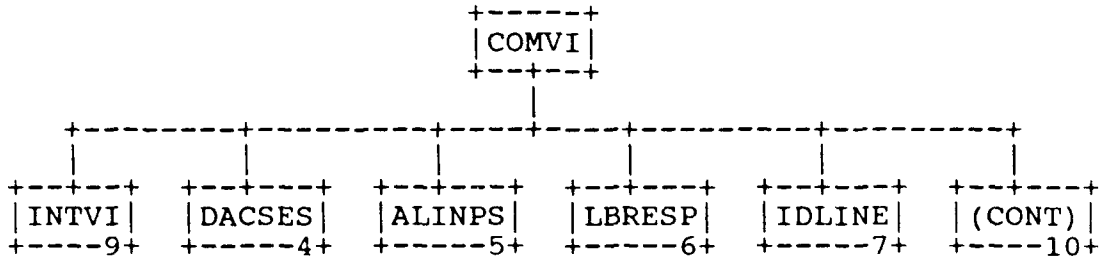
3.10.10 Hierarchy Chart

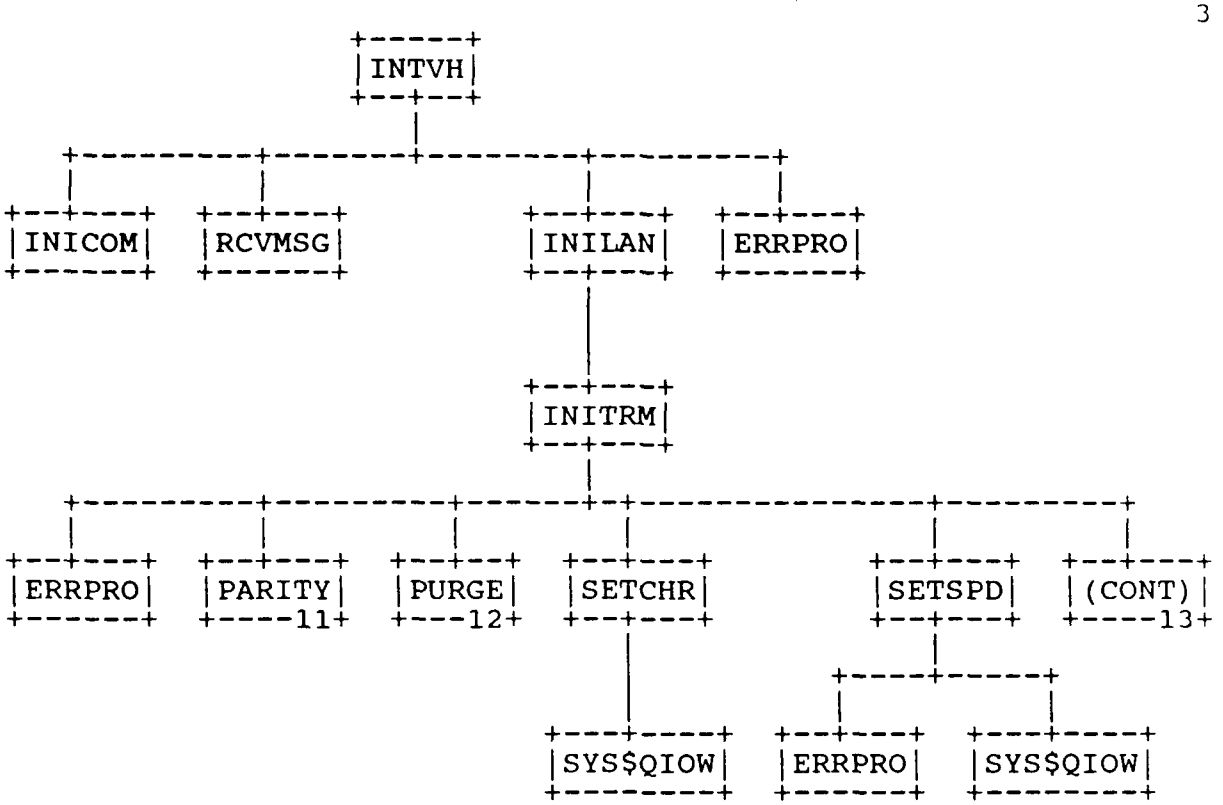
The following hierarchy charts show the relationships between all of the modules mentioned in the above documentation. A module may call a subroutine several times within its code, but the call will only be shown once as a single relationship on this hierarchy chart. All modules shown at the top of the first page are considered Main Programs as described in section 3.10.1 above.

There is an internal paging scheme as marked by the numbers in the upper right corner of each page. An index after the last page of the chart shows where a routine and its calls are first defined. If a routine has no page reference, it either makes no calls or is an external routine. A continuation box on the end of a tree limb shows where that the tree continues on the page numbered mentioned. A number in a box with a routine name points to the page where the routine is further defined within the hierarchy tree. If there is no number in a box, the routine either makes no calls or is an external routine.

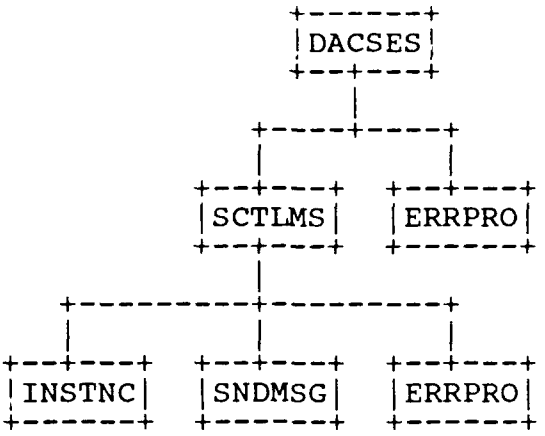
1


COMVH
COMVI
2
INTVH
3
DACSES
4
ALINPS
5
LBRESP
6
IDLINE
7
(CONT)
8


COMVI
INTVI
9
DACSES
4
ALINPS
5
LBRESP
6
IDLINE
7
(CONT)
10


INTVH
INICOM
RCVMSG
INILAN
ERRPRO
INITRM
ERRPRO
PARITY
PURGE
SETCHR
SETSPD
(CONT)
11
12
13
SYS$QIOW
ERRPRO
SYS$QIOW

4



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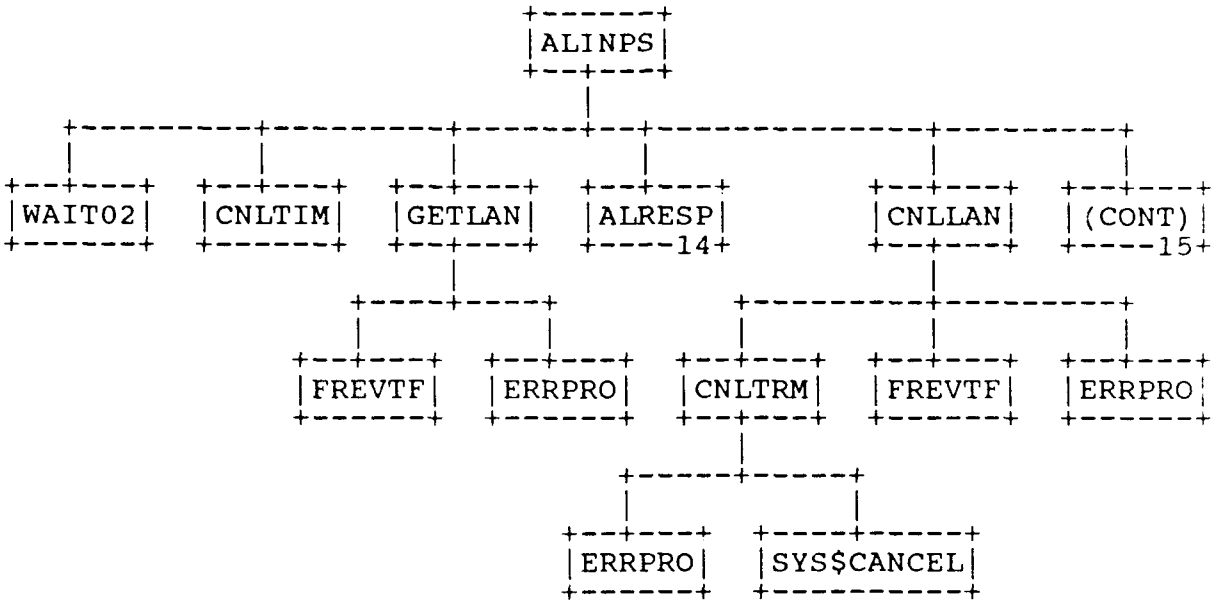
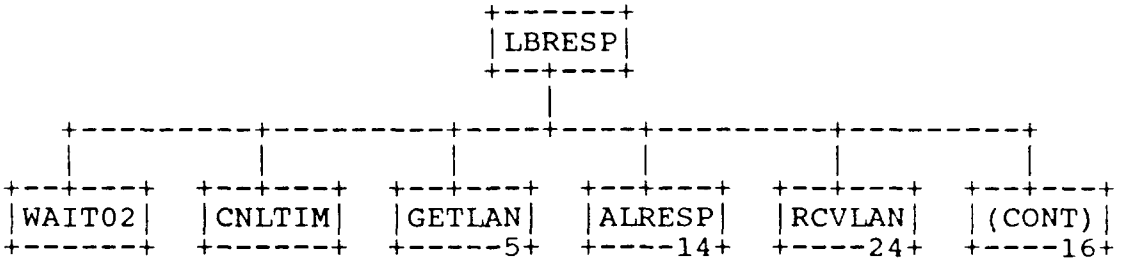
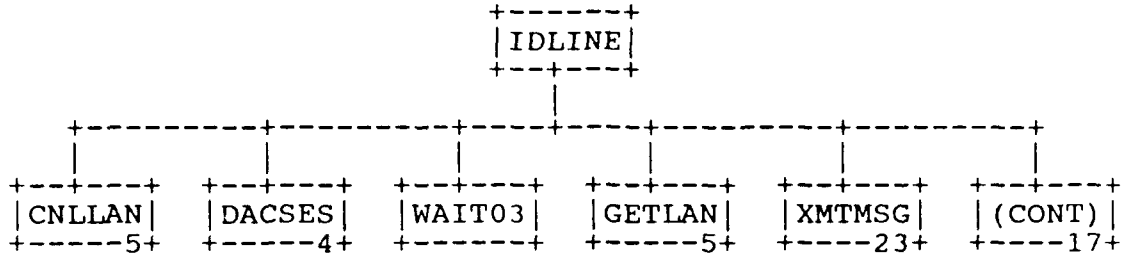

ALINPS
WAIT02
CNLTIM
GETLAN
ALRESP
14
CNLLAN
(CONT)
15
FREVTF
ERRPRO
CNLTRM
FREVTF
ERRPRO
ERRPRO
SYS$CANCEL

6



7



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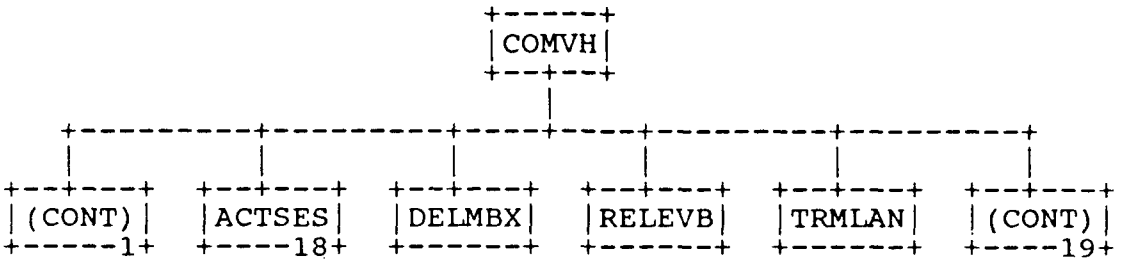
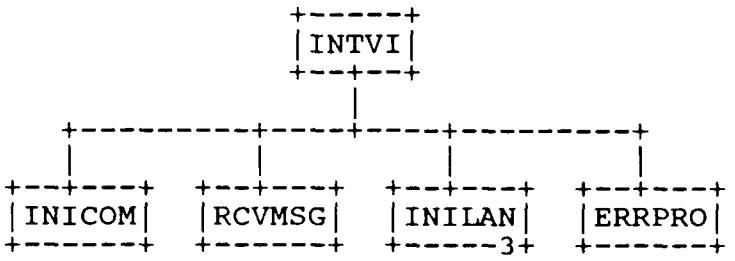
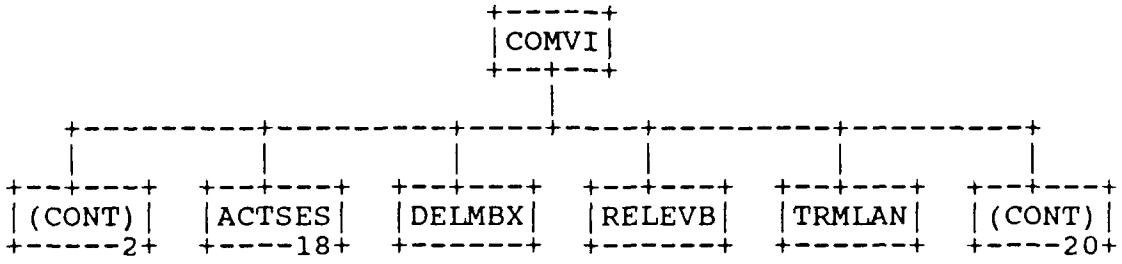
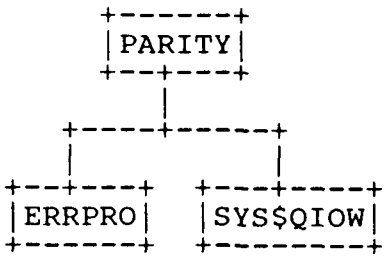
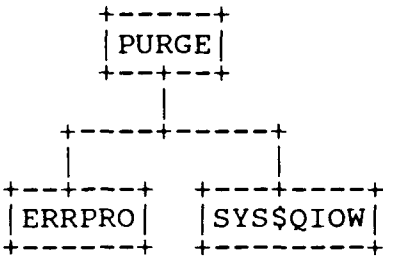


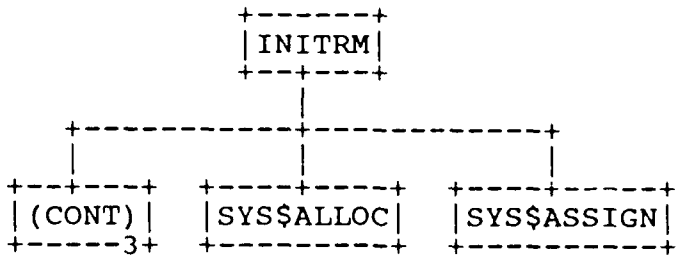

INTVI
INICOM
RCVMSG
INILAN
ERRPRO

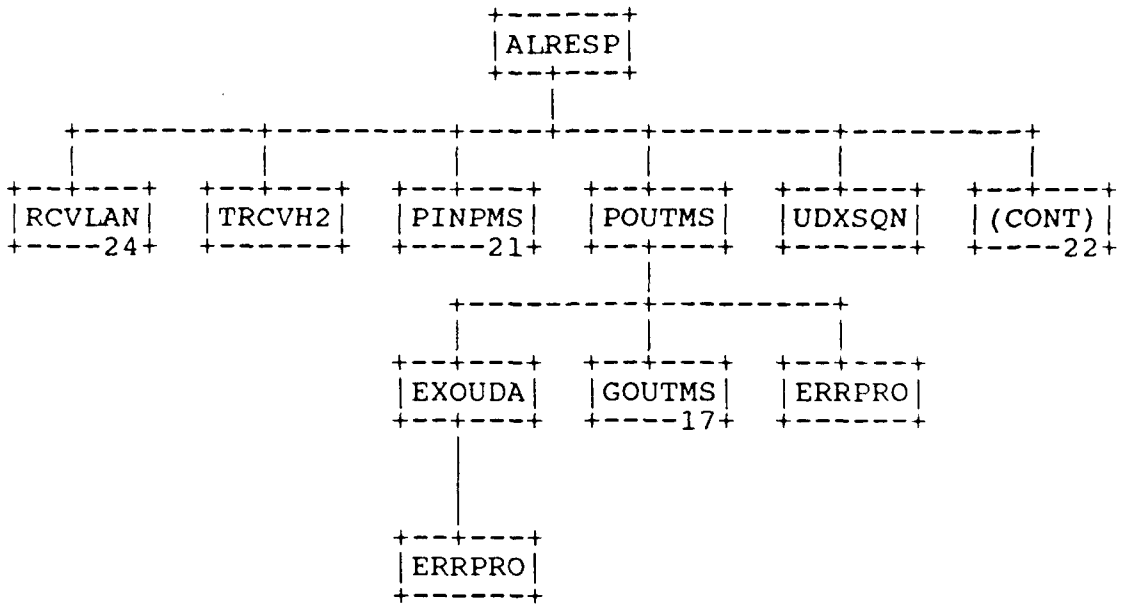
10

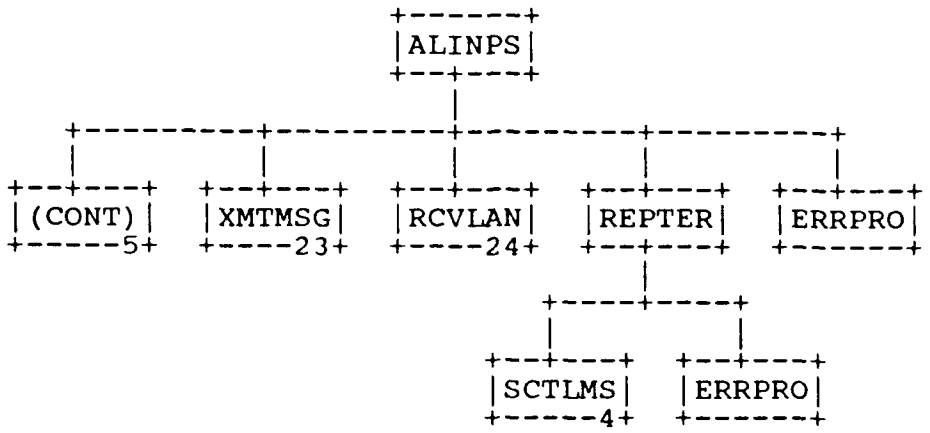



PARITY
ERRPRO
SYS$QIOW

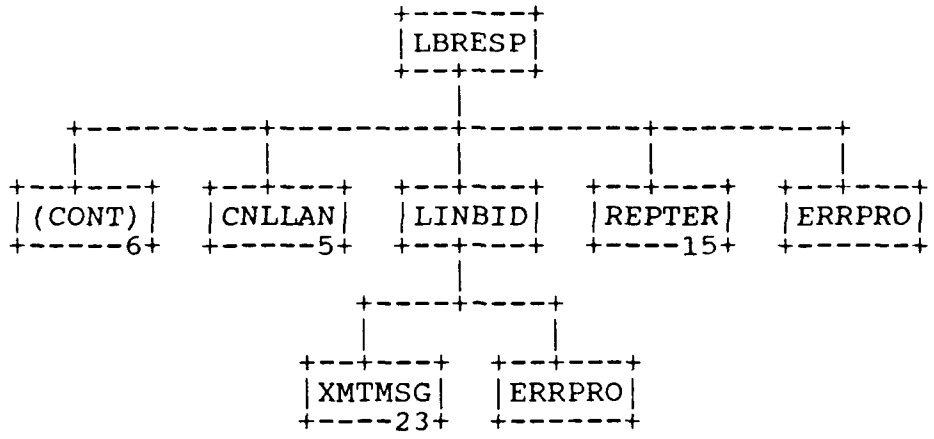

PURGE
ERRPRO
SYS$QIOW

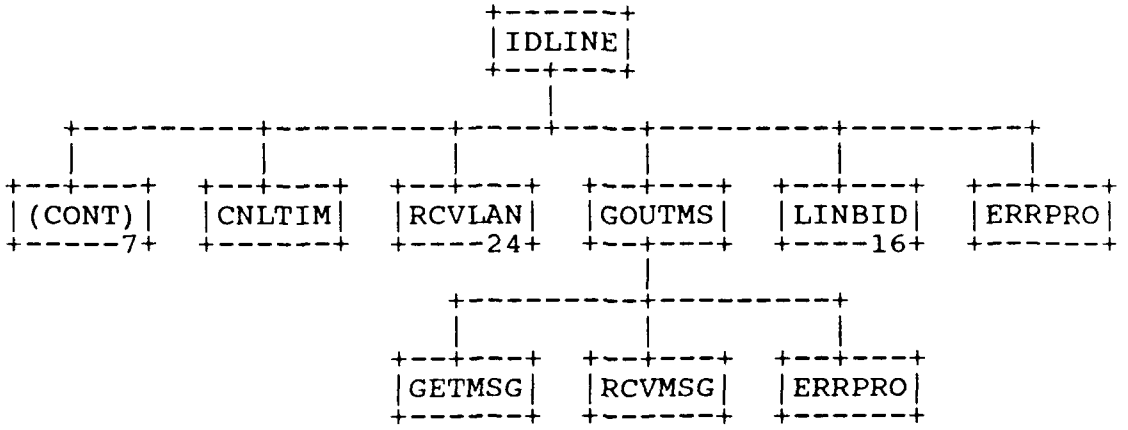

INITRM
(CONT)
3
SYS$ALLOC
SYS$ASSIGN


ALRESP
RCVLAN
24
TRCVH2
PINPMS
21
POUTMS
UDXSQN
(CONT)
22
EXOUDA
GOUTMS
17
ERRPRO
ERRPRO

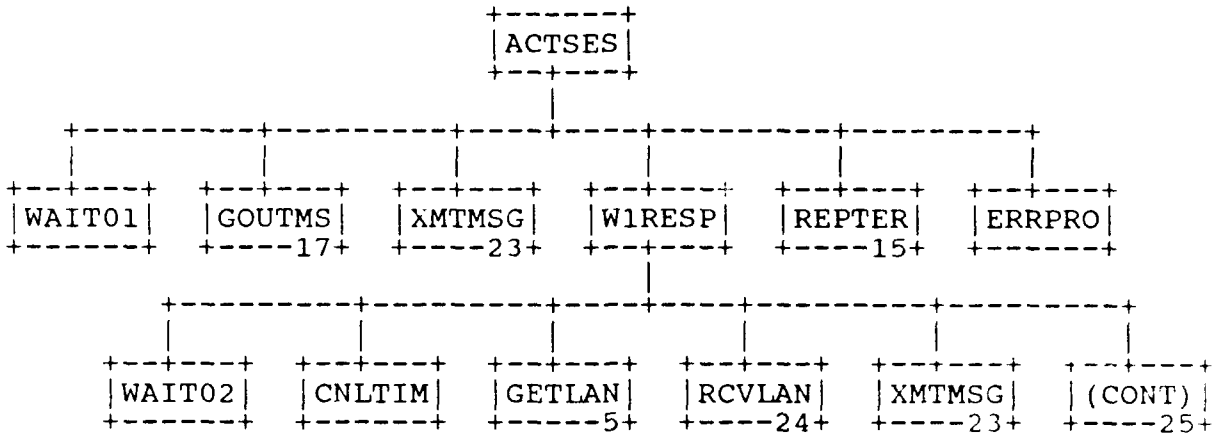

ALINPS
(CONT)
5
XMTMSG
23
RCVLAN
24
REPTER
ERRPRO
SCTLMS
4
ERRPRO

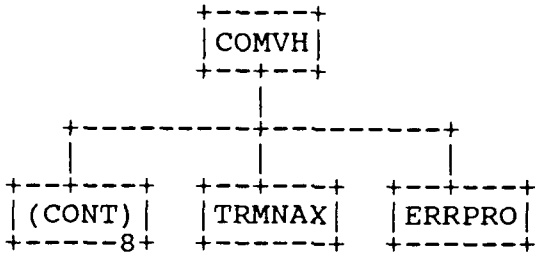
16


LBRESP
(CONT)
6
CNLLAN
5
LINBID
REPTER
15
ERRPRO
XMTMSG
23
ERRPRO

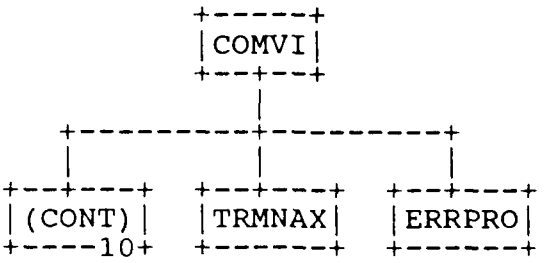

IDLINE
(CONT)
7
CNLTIM
RCVLAN
24
GOUTMS
LINBID
16
ERRPRO
GETMSG
RCVMSG
ERRPRO

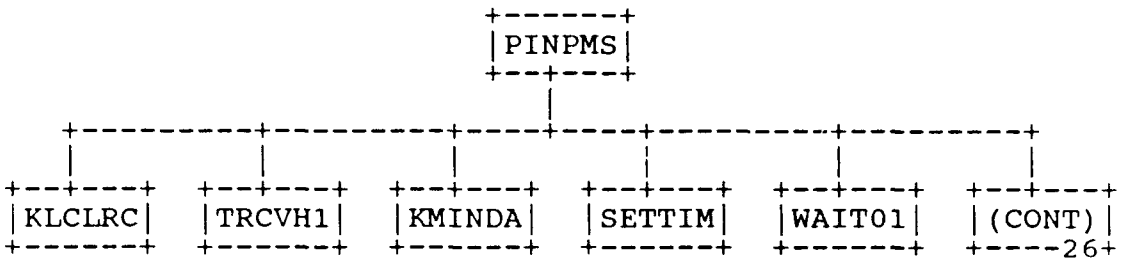
18

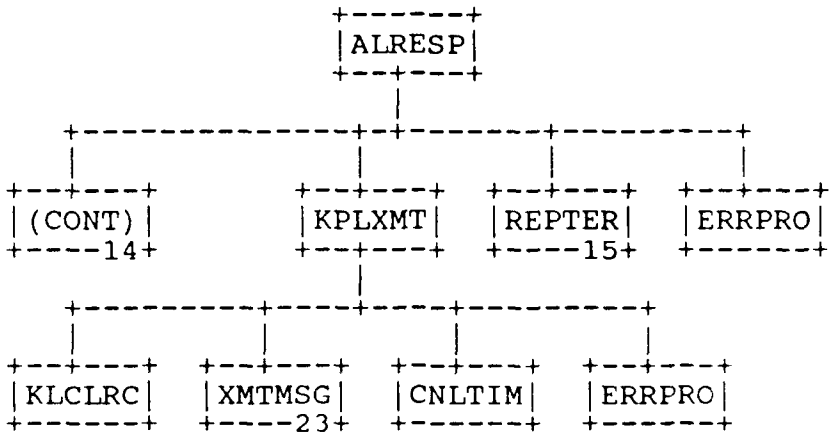

ACTSES
WAIT01
GOUTMS
17
XMTMSG
23
W1RESP
REPTER
15
ERRPRO
WAIT02
CNLTIM
GETLAN
5
RCVLAN
24
XMTMSG
23
(CONT)
25


COMVH
(CONT)
8
TRMNAX
ERRPRO

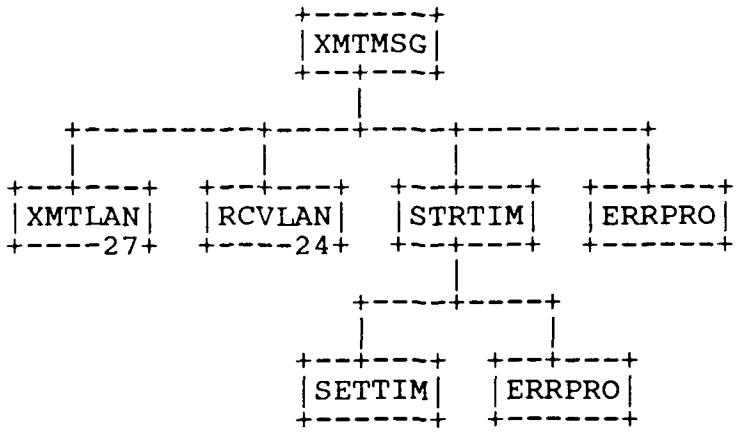
20



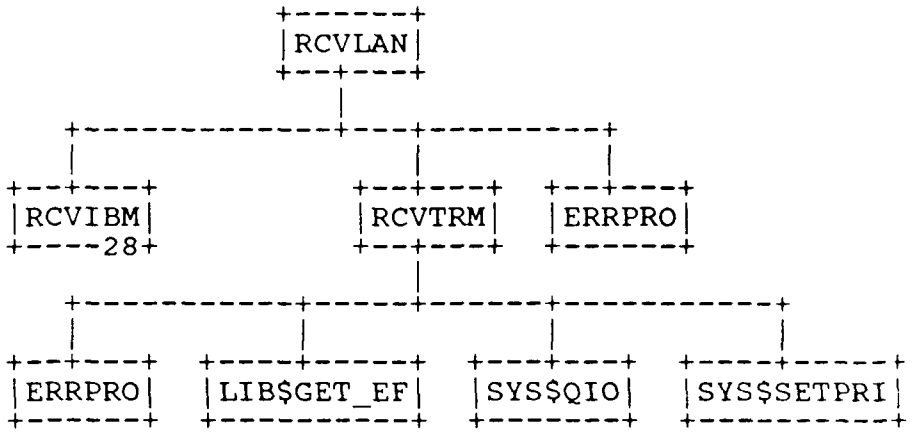

PINPMS
KLCLRC
TRCVH1
KMINDA
SETTIM
WAIT01
(CONT)
26


ALRESP
(CONT)
14
KPLXMT
REPTER
15
ERRPRO
KLCLRC
XMTMSG
23
CNLTIM
ERRPRO

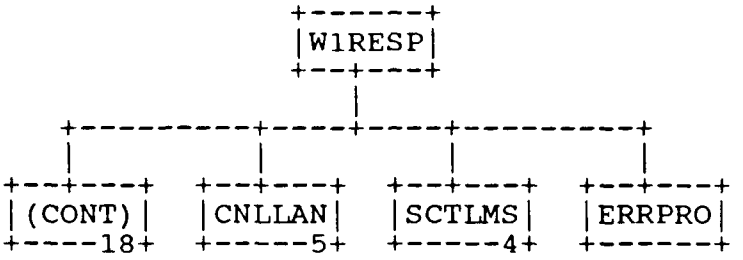
23



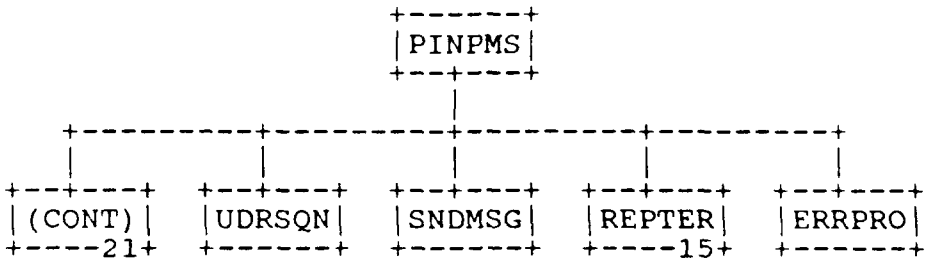
24


RCVLAN
RCVIBM
28
RCVTRM
ERRPRO
ERRPRO
LIB$GET_EF
SYS$QIO
SYS$SETPRI

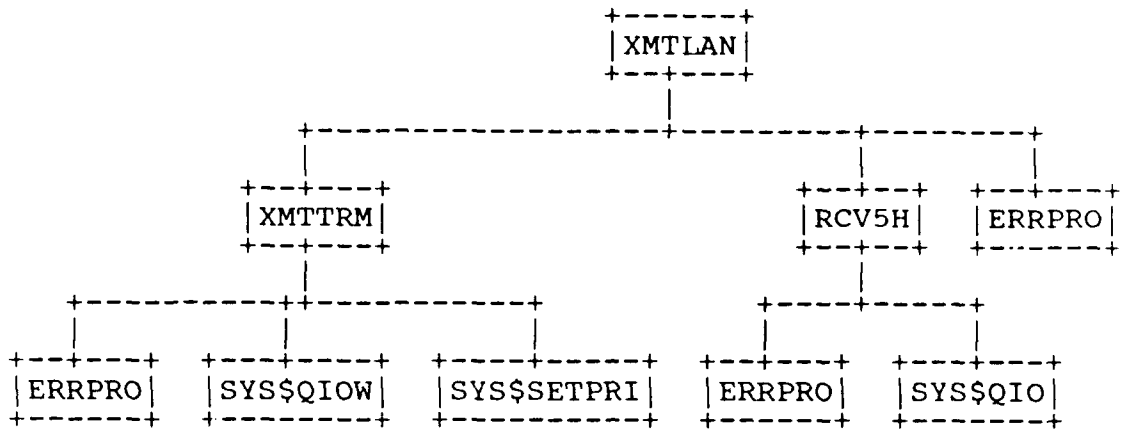
25



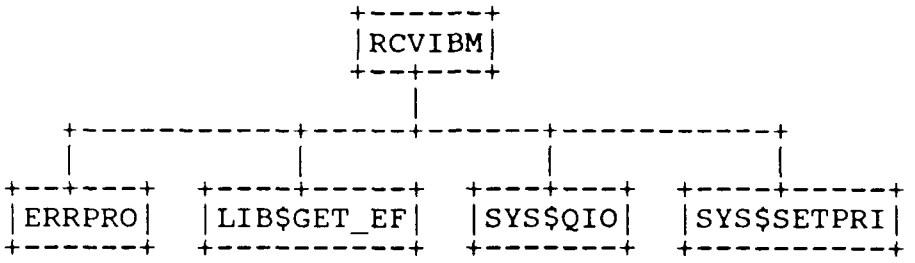
26



27


XMTLAN
XMTTRM
RCV5H
ERRPRO
ERRPRO
SYS$QIOW
SYS$SETPRI
ERRPRO
SYS$QIO

28



3.11 Program Listings Comments

This information is contained in the Module Descriptions in section 3.10.

SECTION 4

QUALITY ASSURANCE PROVISIONS

4.1 Introduction and Definitions

"Testing" is a systematic process that may be preplanned and explicitly stated. Test techniques and procedures may be defined in advance, and a sequence of test steps may be specified. "Debugging" is the process of isolation and correction of the cause of an error.

"Antibugging" is defined as the philosophy of writing programs in such a way as to make bugs less likely to occur and when they do occur, to make them more noticeable to the programmer and the user. In other words, as much error checking as is practical and possible in each routine should be performed.

4.2 Computer Programming Test and Evaluation

The quality assurance provisions for test consists of the normal testing techniques that are accomplished during the construction process. They consist of design and code walk-throughs, unit testing, and integration testing. These tests are performed by the design team. Structured design, design walk-through and the incorporation of "antibugging" facilitate this testing by exposing and addressing problem areas before they become coded "bugs."

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